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Role of active surveillance in thyroid nodule

Abdul Matin

Introduction:

About 68% of the general population have thyroid nodules on routine ultrasonography. That does not mean all nodules should be treated by surgery as most of the nodules are benign and are discovered incidentally. So our primary goal of thyroid nodule evaluation is to determine whether it is malignant. After thyroid ultrasonography has been performed, the next step is measurement of serum thyroid-stimulating hormone. Hyperfunctioning nodules are rarely malignant and do not require tissue sampling. Nonfunctioning nodules and nodules in a patient with a normal or high thyroid-stimulating hormone level may require fine-needle aspiration based on ultrasound characteristics and size. Nodules with suspicious features and solid hypoechoic nodules 1 cm or larger require aspiration. The Bethesda System (categories 1 through 6). Benign nodules (Bethesda II) does not need surgery and need to follow -up with regular physical examination and ultrasonography to see the progress of the nodules (increase in size, suspicious) usually in every one year interval. As surgery is not without risk so many unnecessary surgical intervention lead to recurrent & superior laryngeal nerve damage, voice loss, parathyroid insufficiency, neck scar and life long thyroid hormone replacement. In the UK there is some variation of monitoring of the thyroid nodules. Some hospital clinics discharge patients when cancer has been excluded, whereas other hospitals monitor nodules with repeat ultrasonography. In Ireland including our hospital we monitor benign nodules with repeat ultrasonography every one year interval that is called surveillance ultrasonography.

What is active Surveillance?

Active surveillance is watchful waiting and monitoring benign thyroid nodules and also in many cases of papillary microcarcinoma without any surgical intervention. There are some situation when benign nodules need surgery like rapidly growing nodules, pressure symptoms and on cosmetic ground.

Age, comorbidities and life expectancy should be considered when individualizing treatment, as total

thyroidectomy for older adults with low risk PTC has been associated with higher incidence of complications and hospital readmissions

So active surveillance is a reasonable option for very low risk patients .

In fact, a significant proportion of patients, specifically older individuals with low-risk tumors, may benefit from active surveillance without a surgical intervention. In a large proportion of patients, PTCs are identified as either a papillary microcarcinoma (PMC) or a follicular variant thyroid microcarcinoma, both of which are defined as tumors of < 1cm in diameter with a favorable prognosis . Due to the indolent course of the disease, active surveillance is a strategy implemented by several centers for thyroid nodules up to 1.5 cm in diameter, depending on individual institutional protocols. Tumors larger 1 and less than 1.5 cm (T1bN0M0) appear to have a similar course than tumors < 1 cm (T1aN0M0)

None of the patients with low risk PMC showed distant metastasis or died from thyroid carcinoma during the active surveillance period

Medical costs and adverse events from surgery (recurrent laryngeal nerve injury, parathyroid gland damage and/or anesthetic complications) are higher in patients that undergo immediate resection.

Contraindication to active surveillance;

1. A noncancerous nodule may sometimes require surgery if it's so large that it makes it hard to breathe or swallow. We also consider surgery for people with large multinodular goiters, particularly when the goiters constrict airways, the esophagus or blood vessels.
2. Nodules diagnosed as indeterminate or suspicious by FNAC (Thy 3A or 3F) need diagnostic hemithyroidectomy to rule out cancer.
3. Any clinical features of malignancy like lymphnodes or distant metastasis at diagnosis. signs and symptoms of invasion to the trachea,oesophagus, recurrent laryngeal nerve.

4. High grade malignancy on FNAC (Thy 4/5) or tall cell variant and poorly differentiated carcinoma.

Transition from active surveillance to surgery is considered when

1. Thyroid nodule size increases in the greatest dimension by at least > 3mm from initial measurement,
2. In cases where a new suspicious metastatic LN disease shows cytological evidence for thyroid cancer, and
3. When tumor volume increases by 50 % in three-dimensional measurements

Discussion

Over the past three decades the world wide incidence of thyroid cancer has significantly increased and more than 50% of this increase is related to the identification of papillary thyroid microcarcinoma. Two prospective studies from Japan have shown that active surveillance is feasible for low risk papillary thyroid microcarcinoma patients as most of these tumours remain latent or with slow progression. Other studies showed similar results. On the other hand prognosis of papillary thyroid microcarcinoma is excellent with local recurrence rate of 2-6% and a distant metastasis rate 1-2% and a 20 year disease free survival rate is >99%. So for most of the benign thyroid nodules and low risk papillary thyroid microcarcinoma patients, immediate surgery may lead to more problems like surgical complications, neck scarring, hormone replacement. In another study in china showed active surveillance in Chinese patients with highly suspicious subcentimetre thyroid nodules has good oncological outcomes and can be used as a safe alternative to surgery. Younger patients (≤ 30) show a worse psychological status; therefore, more attention should be paid to younger patients.

Conclusion

Active surveillance is now well practiced around the globe including USA, UK Ireland, China, Japan and many more countries. Unfortunately it is not practiced in Bangladesh and many unnecessary surgical operations are under going resulting in many surgical complications. So in the treatment of thyroid nodules active surveillance can be used as an alternative treatment option to reduce the incidence of adverse effects without affecting treatment outcomes.

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References

1. Kant R, Davis A, Verma V. Thyroid nodules: Advance in evaluation and management. Am Fam Physician (2020);102(5):298-304
2. Sung H, Ferlay J, Siegel RL et al. Global cancer statistics 2020: Globocan estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin (2021);71(3):209-49
3. Davis L, Hoang JK. Thyroid cancer in the USA: Current trends and outstanding questions. Lancet Diabetes Endocrinol (2021);9(1):11-2
4. Ito Y, Mivauchi A, Kihara M, Higashiyama T, Kobayashi K, Miya A. Patient age is significantly related to the progression of papillary microcarcinoma of thyroid under observation. Thyroid (2014);24(1):27-34
5. Chunhao L, Zhao H, Xia Y et al. Active surveillance of highly suspicious nodules cohort in China. Oncol (2022);12 doi.org/10.3389/fonc.2022.981495.

Hospital-Based Evaluation of Anaesthesia Practices in Bangladesh: A Retrospective Study

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Abstract:

Introduction: Anaesthesia management plays a critical role in ensuring patient safety and comfort during and after surgical procedures. The choice of anaesthesia type – whether regional or general – can significantly influence the incidence of complications and overall patient recovery. This study aimed to evaluate anaesthesia practices, monitor complications, and assess patient satisfaction among individuals undergoing various types of surgery. **Methods:** The study was conducted at General Hospital, Pabna, Bangladesh from 1st October 2023 to 30th September 2024. Data were collected from medical records of patients who underwent surgery at a hospital. The study population consisted of 42 individuals, with a higher proportion of females and the largest age group being 18-40 years. Data analysis was performed using SPSS version 26. **Result:** The results of this study indicate that 57.1% of patients received regional anaesthesia, while 42.9% were administered general anaesthesia. Monitoring techniques, including pulse oximetry, ECG, and blood pressure, were widely used, with complications occurring in 33.3% of the population. Post-anaesthesia complications were most commonly nausea (42.9%) and hypotension (4.8%). Satisfaction with anaesthesia was high, with 95.2% of patients reporting satisfaction. A significant negative correlation (-0.361 , $p=0.0188$) was found between general anaesthesia and the absence of complications. **Conclusion:** The findings from this study indicate that regional anaesthesia is associated with fewer post-anaesthesia complications compared to general anaesthesia, as evidenced by the negative correlation between the two. The statistically significant p -value of 0.0188 ($p < 0.05$) underscores the meaningful association between the type of anaesthesia and the occurrence of post-anaesthesia complications.

Introduction:

Anaesthesia is a cornerstone of modern surgical practice, ensuring patient comfort, reducing intraoperative stress responses, and improving surgical outcomes. Globally, anaesthesia services have undergone significant advancements in safety protocols, monitoring technologies, and workforce expansion. However, disparities in anaesthesia practices persist, particularly between high-income countries (HICs) and low- and middle-income

countries (LMICs), where resource constraints limit access to safe anaesthesia care¹. The World Health Organization (WHO) and the World Federation of Societies of Anesthesiologists (WFSA)

have established global guidelines for safe anaesthesia, emphasizing the importance of trained personnel, adequate monitoring, and essential drug availability to improve patient outcomes². Despite these advancements, perioperative mortality remains disproportionately high in LMICs due to inadequate

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anaesthesia services, equipment shortages, and a lack of standardized safety protocols³. Bangladesh, as a developing country, faces significant challenges in ensuring safe and effective anaesthesia practices, necessitating a systematic evaluation of hospital-based anaesthesia services.

The anaesthesia workforce shortage in LMICs is a critical barrier to safe surgical care. A global assessment of anaesthesia capacity has revealed that the provider-to-patient ratio in LMICs is alarmingly low, with some countries having as few as 0.1 anaesthesia providers per 100,000 people, compared to more than 20 per 100,000 in HICs¹. In Bangladesh, there are approximately 0.58 anesthesiologists per 100,000 people, a modest increase from 0.52 in 2012, but still far below the WHO's recommended minimum⁴. Public hospitals, particularly in rural areas, rely on non-physician anesthetists, leading to concerns about variability in anaesthesia administration quality and patient safety. Additionally, disparities exist between urban tertiary care hospitals and district-level healthcare facilities, where a shortage of anaesthesia equipment and trained personnel exacerbates surgical risks⁵. Infrastructure limitations, such as intermittent electricity, unreliable oxygen supplies, and inadequate patient monitoring, further hinder the ability to deliver safe anaesthesia care in district hospitals⁴. Anaesthesia safety protocols in Bangladesh remain poorly documented and inconsistently implemented. A situational analysis of patient safety measures in primary and secondary healthcare facilities in Bangladesh revealed that there are no formalized anaesthesia safety protocols at many district hospitals⁶. Healthcare managers acknowledge the importance of patient safety but lack structured guidelines and adequate human resources to implement proper anaesthesia safety standards. Deficiencies in monitoring devices such as pulse oximeters, electrocardiography (ECG) monitors, and blood pressure monitoring equipment pose a significant risk to patient safety, particularly in emergency settings⁴. In maternal healthcare, for example, general anaesthesia remains the default choice for emergency cesarean sections, despite international evidence supporting the safety and cost-effectiveness of spinal anaesthesia for obstetric

cases⁷. These findings indicate a crucial gap in clinical anaesthesia practices and highlight the need for data-driven interventions to improve safety standards. The importance of retrospective hospital-based evaluations in identifying gaps in anaesthesia services has been demonstrated in multiple studies. A 7-years retrospective analysis of anaesthesia awareness in cancer patients demonstrated the effectiveness of using hospital records to evaluate long-term trends in patient safety and highlight inconsistencies in anaesthesia administration⁸. Another 9-year retrospective study on preventable anaesthesia -related adverse events revealed that 42.8% of anaesthesia complications were preventable, reinforcing the value of retrospective audits in improving patient outcomes⁹. Retrospective data analysis is particularly relevant in resource-constrained settings, as it allows for cost-effective assessment of real-world clinical practices without the logistical and financial burdens associated with prospective studies¹⁰. Given the limited systematic data collection on anaesthesia protocols in Bangladesh, a retrospective study focusing on hospital-based anaesthesia practices can provide critical insights into perioperative patient safety, workforce challenges, and areas for policy intervention. The findings of this study have important policy implications for Bangladesh's healthcare system. Currently, no national database exists to track anaesthesia -related complications, safety protocol adherence, or workforce distribution. Countries that have implemented national anaesthesia registries have shown significant improvements in patient safety outcomes, as retrospective analyses help shape guidelines and resource allocation¹¹. In Bangladesh, policy interventions should focus on workforce expansion, standardized training programs, and ensuring adequate anaesthesia equipment in district hospitals⁴. Furthermore, as seen in the pediatric sepsis protocol study in Dhaka hospitals, the success of healthcare policy changes depends not only on protocol development but also on adherence monitoring and implementation strategies¹². A systematic hospital-based evaluation of anaesthesia services will provide data to guide policymakers, hospital administrators, and professional bodies in strengthening anaesthesia

services across the country. This study aims to evaluate hospital-based anaesthesia practices in Bangladesh through a retrospective analysis of patient records, anaesthesia administration protocols, and perioperative outcomes. By identifying gaps in anaesthesia services, patient safety protocols, and workforce distribution, this research seeks to contribute to evidence-based policy recommendations to enhance anaesthesia care nationwide. Retrospective data will allow for trend analysis over a significant period, enabling comparisons between different hospital types and regions. Ultimately, the study will serve as a foundational resource for healthcare planners, policymakers, and professional organizations to improve anaesthesia safety and access across Bangladesh.

Materials and methods:

The study was conducted at General Hospital, Pabna, Bangladesh from 1st October 2023 to 30th September 2024. Data were collected from medical records of patients who underwent surgery at a hospital. The study population consisted of 42 individuals, with a higher proportion of females and the largest age group being 18-40 years. Surgeries were categorized into general surgery, orthopedic surgery, ENT surgery, and obstetrics/gynecology, with a relatively even distribution. The type of anaesthesia used in each case was recorded, with regional anaesthesia (spinal or epidural) applied to most patients and general anaesthesia to the remaining cases. Monitoring practices, including pulse oximetry, ECG, and blood pressure, were documented, although capnography was not used in any of the cases. The occurrence of anaesthesia-related complications was noted. Post-anaesthesia complications such as nausea, hypotension, and vomiting were recorded, and satisfaction with the anaesthesia care was overwhelmingly positive. Data analysis was performed to explore the relationship between the type of anaesthesia and post-anaesthesia complications, utilizing Pearson's correlation coefficient to assess statistical significance. Data analysis was performed using SPSS version 26.

Results:

The study population primarily consists of individuals aged 18-40 years (61.9%), with a higher proportion of females (61.9%). The distribution of surgeries is relatively even, with general surgery

accounting for 33.3%, followed by orthopedic, ENT, and obstetrics/gynecology surgeries, each comprising 19.0% to 23.8%. The sample includes a small proportion of participants under 18 (19.0%) and over 60 (2.4%). The absence of participants in the "Other" gender and surgery categories indicates a focused demographic in this study. [Table I]

Table I
Distribution of study population based on demographic information (n=42)

Demographic Information	n	%
Age		
<18years	8	19.0
18-40 years	26	61.9
41-60 years	7	16.7
>60 years	1	2.4
Gender		
Male	16	38.1
Female	26	61.9
Other	0	0.0
Type of Surgery		
General Surgery	14	33.3
Orthopaedic Surgery	8	19.0
ENT Surgery	10	23.8
Obstetrics and Gynaecology	10	23.8
Other	0	0.0

In this analysis of anaesthesia practices among the 42-study population, 57.1% (n=24) of procedures used regional anaesthesia, while 42.9% (n=18) used general anaesthesia, with no use of local or combined techniques. 100% of the study population had pulse oximetry monitoring, and most had ECG (66.7%) and blood pressure (90.5%) monitoring, but capnography was not utilized. Despite the extensive monitoring, 33.3% of the study population experienced complications during anaesthesia, highlighting potential risks. The relatively low complication rate, however, suggests adequate anaesthesia management. [Table II]

Table II <i>Distribution of study population based on Anaesthesia Practices (n=42)</i>		
Anaesthesia Practices	n	%
Type of Anaesthesia		
General Anaesthesia	18	42.9
Regional Anaesthesia (Spinal, Epidural)	24	57.1
Local anaesthesia	0	0.0
Combined techniques	0	0.0
Anaesthesia Monitoring Techniques		
Used	42	100.0
Pulse Oximetry	28	66.7
ECG monitoring	38	90.5
Blood Pressure Monitoring	0	0.0
Capnography	0	0.0
Others		
Complications Recorded During Anaesthesia		
Yes	14	33.3
No	28	66.7

In this cohort of 42 study population, 60% (n=25) were transferred to the Post-Anaesthesia Care Unit (PACU), with the majority 57.1% (n=24) staying for less than 1 hour. Post-anaesthesia complications were observed in 24 study populations, with nausea being the most common 42.9% (n=18), followed by hypotension and other complications, each at 4.8% (n=2). Vomiting and respiratory distress were rare, affecting only 4.8% of the study population. Satisfaction with anaesthesia practices was overwhelmingly positive, with 95.2% (n=40) of the study population reporting satisfaction, and only 4.8% (n=2) indicating they were very satisfied. No study population reported dissatisfaction or neutrality. [Table III]

General anaesthesia (n=18) was associated with a higher incidence of nausea (55.6%), vomiting (11.1%), and other complications compared to regional anaesthesia (n=24), which had lower rates of nausea (33.3%) and no cases of vomiting. Hypotension occurred in one patient from each group, while no cases of respiratory distress were observed. A greater proportion of patients under regional anaesthesia (58.3%) experienced no complications compared to those under general anaesthesia (22.2%). Pearson correlation analysis showed a negative correlation (-0.361) between general anaesthesia and the absence of complications, with statistical significance (p=0.0188). [Table IV].

Table III <i>Distribution of study population based on Post-Anaesthesia Care (n=42)</i>		
Post-Anaesthesia Care	n	%
The study population Transferred to the Post-Anaesthesia Care Unit (PACU)	25	60.0
Duration of Stay in the PACU		
<1 hour	24	57.1
1-3 hours	10	23.8
>3 hours	2	4.8
Post-anaesthesia Complications Observed		
Nausea	18	42.9
Vomiting	2	4.8
Respiratory Distress	0	0.0
Hypotension	2	4.8
Other	2	4.8
Overall Satisfaction with Anaesthesia Practices (For Healthcare Providers)		
Very Satisfied	2	4.8
Satisfied	40	95.2
Neutral	0	0.0
Dissatisfied	0	0.0
Very dissatisfied	0	0.0

Table IV
Association between Type of Anaesthesia and Post-Anaesthesia Complications (n=42)

Type of Anaesthesia	Nausea (n=18)	Vomiting (n=2)	Respiratory Distress (n=0)	Hypotension (n=2)	Other (n=2)	No Complications (n=18)	Total (n=42)	Pearson Correlation	p-value
General Anaesthesia (n=18)	10(55.6%)	2(11.1%)	0(0.0%)	1(5.6%)	1(5.6%)	4(22.2%)	18(100%)	-0.361	0.0188
Regional Anaesthesia (n=24)	8(33.3%)	0(0.0%)	0(0.0%)	1(4.2%)	1(4.2%)	14(58.3%)	24(100%)		

Discussion

The study population primarily consisted of individuals aged 18-40 years (61.9%), with a notable female preponderance (61.9%). The diversity of surgeries included in the study, with general surgery accounting for 33.3% and orthopedic, cardiac, and obstetrics/gynecology surgeries accounting for 19.0% to 23.8% each, reflects the typical surgical practice in many settings. The study's findings show that 57.1% of patients received regional anaesthesia, while 42.9% received general anaesthesia. This distribution is consistent with existing literature, which suggests that regional anaesthesia is preferred for many types of surgery due to its ability to provide effective pain relief with fewer systemic effects compared to general anaesthesia^{13,14}. Regional anaesthesia, especially spinal and epidural blocks, is increasingly preferred in various surgical procedures because of its reduced complication rates, which were corroborated by the present study, where regional anaesthesia was associated with fewer complications compared to general anaesthesia¹⁵. In terms of anaesthesia monitoring, pulse oximetry was used in all cases, while ECG and blood pressure monitoring were used in 66.7% and 90.5% of patients, respectively. These high monitoring rates align with recommended best practices in anaesthesia management^{16,17}. While complications during anaesthesia were observed in 33.3% of the population, this rate is relatively low, indicating that anaesthesia management was largely successful, though improvements can be made in minimizing complications such as nausea and vomiting. The post-anaesthesia care unit (PACU) transfer rate of 60% is consistent with previous studies, as it is common practice to transfer patients to the PACU for close monitoring after anaesthesia¹⁸. The majority of patients (57.1%) stayed in the PACU for less than 1 hour, reflecting the short duration of

recovery for patients who undergo less invasive surgical procedures. The complications observed post-anaesthesia were primarily nausea (42.9%), which is a common side effect of general anaesthesia, and hypotension (4.8%), which can occur due to the vasodilatory effects of anaesthetic agents¹⁹. Interestingly, no cases of respiratory distress were reported, indicating that respiratory complications were well managed, likely due to the use of pulse oximetry and ECG monitoring during anaesthesia. The finding that no patients reported dissatisfaction with anaesthesia practices is a testament to the effectiveness of anaesthesia management in this cohort, as satisfaction is a key indicator of the success of anaesthesia care²⁰. The study also revealed a higher incidence of nausea and vomiting in patients receiving general anaesthesia compared to those receiving regional anaesthesia, a result consistent with previous studies showing that general anaesthesia, particularly when using volatile agents, tends to have higher rates of postoperative nausea and vomiting (PONV)²¹. This finding highlights the importance of considering PONV risk factors in anaesthesia planning and underscores the potential benefits of using regional anaesthesia, which has lower rates of these complications²². Hypotension was observed in one patient from each anaesthesia group, which is consistent with the expected hemodynamic changes during anaesthesia, particularly in patients who are older or have pre-existing comorbidities²³. The higher proportion of patients experiencing no complications under regional anaesthesia (58.3%) compared to general anaesthesia (22.2%) further supports the notion that regional anaesthesia is associated with fewer postoperative complications²⁴. A Pearson correlation analysis revealed a statistically significant negative correlation (-0.361) between general anaesthesia and

the absence of complications ($p=0.0188$). This finding suggests that general anaesthesia may be associated with a higher risk of complications compared to regional anaesthesia, particularly in the context of nausea and vomiting, as discussed above. Such results align with findings from other studies that have found regional anaesthesia to be safer in certain populations, particularly for procedures with low to moderate complexity^{25,26}.

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

Conclusion

In conclusion, the findings from this study indicate that regional anaesthesia is associated with fewer post-anaesthesia complications compared to general anaesthesia, as evidenced by the negative correlation between the two. The statistically significant p -value of 0.0188 ($p < 0.05$) underscores the meaningful association between the type of anaesthesia and the occurrence of post-anaesthesia complications. These results suggest that regional anaesthesia may offer a safer alternative, particularly in reducing complications such as nausea and vomiting, highlighting the need for careful anaesthesia selection tailored to individual patient needs.

Recommendation

Based on the findings of this study, it is recommended that regional anaesthesia be considered the preferred approach in patients undergoing elective surgeries, particularly when aiming to minimize post-anaesthesia complications such as nausea and vomiting. The significant association between regional anaesthesia and fewer complications suggests that it could be a safer option for many patients. However, anaesthesia choices should still be individualized, taking into account patient factors, the type of surgery, and potential risks, with ongoing monitoring and adjustments as necessary to optimize patient outcomes.

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References

1. Hadler RA, Chawla S, Stewart BT, McCunn MC, Kushner AL. Anaesthesia Care Capacity at Health Facilities in 22 Low- and Middle-Income Countries. *World Journal of Surgery* [Internet]. 2016 [cited 2025

Feb 26];40(5):1. Available from: <https://online.library.wiley.com/doi/abs/10.1007/s00268-016-3430-4>

2. Harfaoui W, Ziani H, Slaihi Z, Arfaoui M, Armel B, Elhamzaoui H, et al. Compliance with World Health Organization (WHO)-World Federation of Societies of Anesthesiologists (WFAS) Standards for General Anaesthesia at Ibn Sina University Hospital Center, Morocco. *Cureus* [Internet]. 2024 Jan 9 [cited 2025 Feb 26];16(1). Available from: <https://www.cureus.com/articles/209510-compliance-with-world-health-organization-who-world-federation-of-societies-of-anesthesiologists-wfas-standards-for-general-anaesthesia-at-ibn-sina-university-hospital-center-morocco>
3. Dubowitz G, Detlefs S, Kelly McQueen KA. Global Anaesthesia Workforce Crisis: A Preliminary Survey Revealing Shortages Contributing to Undesirable Outcomes and Unsafe Practices. *World Journal of Surgery* [Internet]. 2010 [cited 2025 Feb 26];34(3):2014. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1007/s00268-009-0229-6>
4. Meadows JW, Al Imran TMT, LeBrun DG, Mannan MI, Sharraf S, Gaznavi ZZ, et al. Anaesthesia Infrastructure and Resources in Bangladesh. *Anaesthesia & Analgesia* [Internet]. 2020 Jan [cited 2025 Feb 26];130(1):233. Available from: [anaesthesia https://journals.lww.com/anaesthesiaanalgesia/fulltext/2020/01000/anaesthesia_infrastructure_and_resources_in.31.aspx](https://journals.lww.com/anaesthesiaanalgesia/fulltext/2020/01000/anaesthesia_infrastructure_and_resources_in.31.aspx)
5. LeBrun DG, Dhar D, Sarkar MdIH, Imran TMTA, Kazi SN, McQueen KAK. Measuring Global Surgical Disparities: A Survey of Surgical and Anaesthesia Infrastructure in Bangladesh. *World Journal of Surgery* [Internet]. 2013 [cited 2024 Jul 7];37(1):1. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1007/s00268-012-1806-7>
6. R T, A B. Situation Analysis to Understand The Patient Safety Context at Primary And Secondary Health Care Facilities in Bangladesh. *Asian Journal of Behavioural Sciences* [Internet]. 2019 Dec 30 [cited 2025 Feb 26]; 1(2):36–46. Available from: <https://myjms.mohe.gov.my/index.php/ajbs/article/view/7577>
7. Islam A, Khanum E, Alom S, Sumi SB, Begum N, Hoque MR. Outcome of Spinal Anaesthesia during Emergency Cesarean Section for Severe Preeclampsia and Eclampsia Patients in a Tertiary Care Hospital. *Journal of Enam Medical College* [Internet]. 2019 Sep 22 [cited 2025 Feb 26];9(3):170–

6. Available from: <https://www.banglajol.info/index.php/JEMC/article/view/43246>
8. Cascella M, Viscardi D, Schiavone V, Mehrabmi-Kermani F, Muzio MR, Forte CA, et al. A 7-Year Retrospective Multisource Analysis on the Incidence of Anaesthesia Awareness with Recall in Cancer Patients: A Chance of Collaboration Between Anesthesiologists and Psycho-Oncologists for Awareness Detection. *Medicine* [Internet]. 2016 Feb [cited 2025 Feb 26];95(5): e2757. Available from: https://journals.lww.com/md-journal/fulltext/2016/02020/a_7_year_retrospective_multisource_analysis_on_the.77.aspx
9. Curatolo CJ, McCormick PJ, Hyman JB, Beilin Y. Preventable Anaesthesia-Related Adverse Events at a Large Tertiary Care Center: A Nine-Year Retrospective Analysis. *The Joint Commission Journal on Quality and Patient Safety* [Internet]. 2018 Dec 1 [cited 2025 Feb 26];44(12):708–18. Available from: <https://www.sciencedirect.com/science/article/pii/S1553725017305974>
10. Padish-Clarín G, Hawkins AJ. Retrospective Analysis of Decreasing the Use of Anaesthesia in Pediatric Audiology: A Preliminary Study. *Am J Audiol*. 2015 Dec;24(4):557–62.
11. Henry JA, Reyes AM, Ameh E, Yip CH, Nthumba P, Mehes M, et al. international consensus recommendations for the optimal prioritization and distribution of surgical services in low-income and middle-income countries: a modified Delphi process. *BMJ Open* [Internet]. 2023 Jan 1 [cited 2025 Feb 26];13(1): e062687. Available from: <https://bmjopen.bmj.com/content/13/1/e062687>
12. Kortz TB, Axelrod DM, Chisti MJ, Kache S. Clinical outcomes and mortality before and after implementation of a pediatric sepsis protocol in a limited resource setting: A retrospective cohort study in Bangladesh. *PLOS ONE* [Internet]. 2017 Jul 28 [cited 2025 Feb 26];12(7): e0181160. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0181160>
13. Goudra B, Sundararaman L, Chandar P, Green M. Anaesthesia for Bronchoscopy – An Update. *Journal of clinical medicine*. 2024;13(21):6471.
14. Barrington M. Regional anaesthesia: what matters? [cited 2025 Feb 26]; Available from: <https://www.aqua.ac.nz/upload/resource/3%20What%20matters.pdf>
15. Pincus E. Regional Anaesthesia: An Overview. *AORN Journal*. 2019 Sep;110(3):263–72.
16. Kheterpal S, O'Reilly M, Englesbe MJ, Rosenberg AL, Shanks AM, Zhang L, et al. Preoperative and intraoperative predictors of cardiac adverse events after general, vascular, and urological surgery. *Anesthesiology*. 2009;110(1):58–66.
17. Klein AA, Meek T, Allcock E, Cook TM, Mincher N, Morris C, et al. Recommendations for standards of monitoring during anaesthesia and recovery 2021: Guideline from the Association of Anaesthetists. *Anaesthesia*. 2021 Sep;76(9):1212–23.
18. Checketts M, Jenkins B, Pandit J. Implications of the 2015 AAGBI recommendations for standards of monitoring during anaesthesia and recovery. *Anaesthesia* [Internet]. 2017 [cited 2025 Feb 26];72(S1). Available from: https://ora.ox.ac.uk/objects/uuid:b65a5818-048f-42b7-b45b-512b0ca30854/files/md61c501785adbe_10253fde2cbd78f196
19. Habib AS, Gan TJ. Evidence-based update and controversies in the treatment and prevention of postoperative nausea and vomiting. *Advances in anaesthesia*. 2009;27(1):143–65.
20. Capuzzo M, Gilli G, Paparella L, Gritti G, Gambi D, Bianconi M, et al. Factors predictive of patient satisfaction with anaesthesia. *Anaesthesia & Analgesia*. 2007;105(2):435–42.
21. Gan TJ. Risk factors for postoperative nausea and vomiting. *Anaesthesia & Analgesia*. 2006;102(6): 1884–98.
22. Jeltng Y, Klein C, Harlander T, Eberhart L, Roewer N, Kranke P. Preventing nausea and vomiting in women undergoing regional anaesthesia for cesarean section: challenges and solutions. *LRA*. 2017 Aug; Volume 10:83–90.
23. Šklebar I, Bujas T, Habek D. Spinal anaesthesia-induced hypotension in obstetrics: prevention and therapy. *Acta Clinica Croatica*. 2019;58(Suppl 1):90.
24. Ramlogan RR, Chuan A, Mariano ER. Contemporary training methods in regional anaesthesia: fundamentals and innovations. *Anaesthesia*. 2021 Jan;76(S1):53–64.
25. Cao M, Zhang Y, Sheng R, Gao W, Kang Q, Gao Y, et al. General Anaesthesia Versus Regional Anaesthesia in the Elderly Patients Undergoing Hip Fracture Surgeries: A Systematic Review and Meta Analysis of Randomized Clinical Trials. *World j surg*. 2023 Jun;47(6):1444–56.
26. Osama H, Saeed H, Nicola M, Emad M. Neuraxial Anaesthesia compared to general anaesthesia in subjects with hip fracture surgery: a meta-analysis. *International Journal of Clinical Medical Research*. 2023;1(2):66–76.

Comparative Study between Humby Knife and Shaving Blade Skin Grafts in 100 Patients: A Prospective Randomized Controlled Trial

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Abstract:

Background: Split-thickness skin grafting (STSG) is a cornerstone in reconstructive surgery. The Humby knife and shaving blade are two techniques for harvesting grafts, but their comparative efficacy remains understudied. This trial evaluates outcomes of both methods in 100 patients.

Methods: A single-center RCT (2021–2023) 100 patients dividing 2 groups, having procedure of Humby knife (n=50) and shaving blade (n=50). Primary outcomes included graft take rate and complications; secondary outcomes were operative time, pain scores, and cosmetic results. Statistical analysis used t-tests, chi-square, and multivariate regression.

Results: The Humby knife group had higher graft take rates (94% vs. 82%, $p=0.03$), lower infection rates (4% vs. 14%, $p=0.04$), and superior cosmesis (Humby : 6% vs. Shaving 18% ($p=0.03\%$). Operative time was longer for Humby (28.5 ± 4.1 vs. 18.2 ± 3.8 minutes, $p<0.001$).

Conclusion: The Humby knife offers superior graft survival and cosmetic outcomes despite longer operative time, advocating its use in critical reconstructive cases.

Introduction:

Skin grafting remains a cornerstone in the management of extensive cutaneous defects caused by burns, trauma, chronic ulcers, and oncologic resections. Among grafting techniques, split-thickness skin grafts (STSGs) are widely preferred due to their balance between donor site healing and graft adaptability, making them indispensable in reconstructive surgery⁽¹⁾. The success of STSGs hinges on precise harvesting techniques, which influence graft viability, donor site morbidity, and aesthetic outcomes. While mechanical dermatomes like the Humby knife are lauded for their precision, sterile shaving blades have emerged as a pragmatic alternative in resource-limited settings. Despite their

widespread use, comparative data on these methods remain sparse, underscoring the need for evidence-based guidelines to optimize clinical outcomes².

The Humby knife, a calibrated manual dermatome, enables surgeons to harvest STSGs of consistent thickness (0.1–0.4 mm) through an adjustable depth gauge, minimizing donor site trauma³. Its reliability in producing uniform grafts has cemented its role in high-resource environments, particularly for burns and complex reconstructions. Conversely, sterile shaving blades—cost-effective, disposable, and accessible—are frequently employed in low- and middle-income countries (LMICs) where advanced dermatomes are unavailable⁴. However, concerns persist regarding their ability to maintain graft

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uniformity, with studies suggesting variable outcomes depending on operator skill⁵. This dichotomy highlights a critical gap in surgical practice: the lack of standardized comparisons between these tools in similar clinical cohorts.

Existing literature offers fragmented insights. A 2020 randomized trial by Brown et al. reported 94% graft viability with the Humby knife in burn patients, attributing success to its controlled depth mechanism. In contrast, Patel et al. (2021) demonstrated 89% viability using shaving blades in diabetic ulcers, albeit with higher donor site complications⁶. Such disparities in study populations and endpoints hinder direct comparisons, leaving surgeons without consensus on tool selection. Furthermore, donor site morbidity – a key determinant of patient recovery – remains understudied in this context. Excessive dermal injury from irregular harvesting can prolong healing, increase infection risks, and exacerbate scarring, emphasizing the need for rigorous technique evaluation⁷.

This study addresses these gaps by comparing Humby knife and shaving blade techniques in 100 patients requiring STSGs for diverse etiologies. Primary objectives include assessing intraoperative efficiency (harvest time, graft thickness uniformity), postoperative outcomes (graft take rates, complications), and donor site morbidity (healing duration, scarring). Secondary analyses evaluate cost-effectiveness and patient satisfaction, offering a holistic view of each method's strengths and limitations.

The rationale for this investigation extends beyond technical comparison. Global disparities in surgical resources necessitate adaptable solutions: while high-income settings prioritize precision, LMICs often prioritize accessibility⁸. Demonstrating the non-inferiority of shaving blades could expand access to life-saving care without compromising outcomes. Conversely, quantifying the Humby knife's advantages in reducing morbidity may justify investments in surgical infrastructure. Additionally, this study aligns with the World Health Organization's mandate to promote equitable surgical care through context-appropriate innovations⁹.

In conclusion, this comparative analysis bridges a critical evidence gap, offering actionable insights for

surgeons navigating diverse healthcare landscapes. By elucidating the trade-offs between precision and accessibility, it informs guidelines that harmonize clinical efficacy with resource realities, ultimately advancing equitable reconstructive care worldwide.

Materials and Methods:

Study Design

- Type: Prospective, single-blinded RCT
- Setting: 250 Bedded General Hospital, Pabna, Bangladesh (January 2021–December 2023).

Participants

- Inclusion: Adults (18–70 years) requiring STSG for burns, trauma, or post-cancer excision.
- Exclusion: Immunocompromised status, diabetes mellitus, or active infection.

Randomization

- Computer-generated block randomization (1:1 allocation).
- Group A: Humby knife (n=50).
- Group B: Shaving blade (n=50).

Interventions

- Humby Knife: Graft harvested at 0.3 mm thickness using a standardized technique.
- Shaving Blade: Freehand harvesting with a Goulian blade.
- Both groups received identical donor-site dressings (alginate) and postoperative care.

Outcomes

- Primary:
 1. Graft take rate at 7 days (percentage of viable graft).
 2. Complications (infection, hematoma, graft necrosis).
- Secondary:
 1. Operative time (minutes).
 2. Pain scores (Visual Analog Scale, VAS 0–10).
 3. Cosmetic outcome (VAS by blinded plastic surgeon at 6 months).

Statistical Analysis

- SPSS v27.0; t-tests for continuous variables, chi-square/Fisher's exact test for categorical data.
- Multivariate logistic regression for confounders (age, BMI).

- Power: 80% power ($\alpha=0.05$) to detect a 15% difference in graft take rates.

Results

Baseline Characteristics

Groups were comparable in age (Humby: 45 ± 12 vs. Shaving: 48 ± 14), BMI (25 ± 3 vs. 26 ± 4), and defect etiology (burns: 60% vs. 58%).

Primary Outcomes

1. Graft Take Rate:

- Humby: 94% (47/50) vs. Shaving: 82% (41/50) ($p=0.03$; OR 3.1, 95% CI 1.1–8.7).

2. Complications:

- Infection: 4% (2/50) vs. 14% (7/50) ($p=0.04$).
- Partial necrosis: 6% (3/50) vs. 12% (6/50) ($p=0.18$).

Secondary Outcomes

1. Operative Time:

- Humby: 28.5 ± 4.1 minutes vs. Shaving: 18.2 ± 3.8 minutes ($p<0.001$).

2. Pain Scores:

- Humby: 3.2 ± 1.1 vs. Shaving: 4.5 ± 1.3 ($p=0.002$).

3. Donor site Epithelialization:

- Humby: 10.2 ± 2.1 vs. Shaving: 14.5 ± 3.6 ($p<0.01$).

4. Cosmesis (Hypertrophic scar):

- Humby : 6% vs. Shaving 18% ($p=0.03\%$)

Multivariate Analysis

Humby knife independently predicted graft success (adjusted OR 2.9, 95% CI 1.2–7.0).

Discussion:

This prospective randomized controlled trial compared the efficacy, safety, and cosmetic outcomes of split-thickness skin grafts (STSGs) harvested using the Humby knife versus conventional shaving blades in 100 patients. The results demonstrated significant advantages for the Humby knife in graft take rates, infection rates, and cosmesis, albeit with longer operative times. These findings align with existing literature on precision in graft harvesting and underscore the trade-offs between technical complexity and clinical outcomes.

Summary of Key Findings:

1. **Graft Take Rate:** The Humby knife group achieved a significantly higher mean graft take rate (94%) compared to the manual shaving blade

group (82%) ($p=0.03$). This 12% absolute difference represents a clinically substantial improvement in graft survival.

2. **Infection Rate:** Postoperative graft site infection rates were markedly lower in the Humby group (4%) than in the shaving blade group (14%) ($p=0.04$).
3. **Cosmesis:** Assessment of long-term cosmetic outcomes revealed superior results with the Humby knife, with only 6% rated as poor compared to 18% in the shaving blade group ($p=0.03$).
4. **Operative Time:** The primary trade-off identified was operative time. Harvesting with the Humby knife took significantly longer (28.5 ± 4.1 minutes) than with the manual shaving blade (18.2 ± 3.8 minutes) ($p<0.001$).

Interpretation and Contextualization:

1. Superior Graft Take with the Humby Knife:

The significantly higher graft take rate observed with the Humby knife is the most compelling finding. Successful graft “take” relies on rapid revascularization, which is critically dependent on the quality and viability of the grafted tissue and the condition of the recipient bed. The Humby knife, with its adjustable guard and calibrated blade, allows for precise control over graft thickness and uniformity. This contrasts sharply with the manual shaving blade, where thickness is entirely dependent on the surgeon’s skill, hand stability, and pressure, leading to inherent variability. **Inconsistent graft thickness is a well-documented risk factor for graft failure.** Grafts that are too thin are fragile and prone to desiccation or necrosis, while excessively thick grafts may have impaired plasmatic imbibition and capillary inosculation due to a higher metabolic demand and greater distance for vascular ingrowth^{10,11}. The uniformity provided by the Humby likely minimizes areas of critically thin or irregular graft, ensuring a more robust sheet of viable dermis capable of surviving the initial ischemic phase and integrating effectively. This finding aligns with the principle that technical precision directly translates to improved biological outcomes in grafting¹².

2. Reduced Infection Risk :

The nearly 3.5-fold lower infection rate in the Humby group (4% vs. 14%) is highly significant

and likely multifactorial. Firstly, the more uniform, predictable graft thickness achieved with the Humby knife minimizes trauma to the donor site dermis. Excessive depth or irregular harvesting with a manual blade creates a more irregular wound bed with deeper dermal injuries and potentially exposed adnexal structures, increasing the surface area and vulnerability to bacterial colonization and invasive infection^{13,14}. Secondly, the guarded design of the Humby knife may offer a marginal mechanical advantage in preventing direct contamination compared to a completely exposed blade, although strict aseptic technique is paramount in both methods. The cleaner, more controlled donor site wound created by the Humby knife likely heals faster with less inflammation, creating a less hospitable environment for pathogens¹⁵. This reduction in donor site morbidity directly contributes to lower overall infection burden, which can also impact graft survival indirectly.

3. Enhanced Cosmetic Outcomes:

The superior long-term cosmesis observed with the Humby knife donor sites is a crucial patient-centered outcome. Poor cosmesis (hypertrophic scarring, dyspigmentation, contour irregularities) primarily stems from aberrant healing at the donor site, often triggered by excessive depth of harvest or irregular injury patterns damaging the reticular dermis^{16,17}. As established, the Humby knife provides superior control over depth and uniformity. By consistently harvesting within the optimal split-thickness range (avoiding deep dermal injury) and creating a smoother wound bed, the regenerative healing process is favored over reparative (scar-forming) healing⁷. The manual shaving blade, prone to creating uneven depths and focal areas of deeper injury, disrupts the dermal architecture more severely, leading to a higher incidence of hypertrophic scarring and pigmentary changes, reflected in the significantly higher rate of poor cosmesis (18% vs 6%).

4. Operative Time Trade-off:

The significantly longer operative time for the Humby knife (mean difference ~10 minutes) is an undeniable practical consideration. This difference arises from the setup (attaching and calibrating the guard) and the inherent nature of the instrument. The guarded blade requires careful positioning and a controlled, steady

motion for optimal graft harvest. The manual shaving blade, while less controlled, is undeniably quicker to deploy and maneuver. **However, the clinical significance of this time difference must be weighed against the substantial benefits.** Ten extra minutes in the context of most reconstructive procedures involving skin grafting is often marginal. Furthermore, this time represents an investment yielding significantly better graft survival, lower infection rates, and improved long-term appearance – outcomes that directly impact patient morbidity, potential need for regrafting, overall cost of care, and patient satisfaction. Efficiency with the Humby knife also improves with surgeon experience¹⁸.

Strengths and Limitations:

İ% **Strengths:** The prospective randomized controlled design minimizes selection bias and provides the highest level of evidence for comparing these techniques. The relatively large sample size (n=100 patients) provides adequate power to detect clinically meaningful differences in key outcomes. Standardized protocols for harvesting technique, postoperative care, and outcome assessment enhance internal validity.

İ% **Limitations:** The study was conducted at a single center, potentially limiting generalizability. Assessment of cosmesis, while performed by independent assessors blinded to the harvesting method, remains inherently subjective, despite the use of a defined scale; more objective measures (e.g., scar elasticity meters, spectrophotometry) could be incorporated in future studies. The study focused on immediate and medium-term outcomes; longer-term follow-up (>1 year) for scar maturation and patient satisfaction surveys would add further depth. The specific indications for grafting and recipient site locations, while likely similar between groups due to randomization, were not stratified in the analysis. Cost analysis (instrument cost, blade cost, operative time cost) was not performed but is a relevant factor for resource-constrained settings.

Clinical Implications and Conclusions:

This study provides strong evidence that the Humby knife offers significant advantages over the traditional manual shaving blade for STSG harvesting. The

Humby knife demonstrably improves the biological success of grafting through higher take rates, reduces complications via lower infection rates, and enhances the long-term aesthetic result at the donor site. While it requires a longer operative time (approximately 10 minutes), this trade-off appears clinically justified given the magnitude of the benefits in terms of graft survival, reduced morbidity, and superior cosmesis.

The findings strongly support the use of the Humby knife as the preferred instrument for STSG harvesting in settings where it is available and where optimal graft outcomes and donor site appearance are priorities. Its precision and consistency translate directly into tangible patient benefits. The manual shaving blade, while faster and potentially more accessible in very resource-limited settings, carries a significantly higher risk of graft failure, infection, and poor cosmetic results.

References:

1. Ratner D. Skin grafting. *Dermatol Clin*. 2016; 34(1):39-48
2. Hackl F, Bergmann J, Granter SR, Lumenta DB, Kamolz LP, Frey M. Efficacy of manual versus powered dermatomes in skin graft harvesting. *Plast Reconstr Surg*. 2019; 143(2):450-457.
3. Singh M, Gupta A, Sharma RK. The Humby knife: A reliable tool for split-thickness skin grafts. *Indian J Plast Surg*. 2020; 53(2):234-239.
4. Yadav S, Rawat S, Gupta A. Cost-effective skin grafting in low-resource settings: The role of shaving blades. *Trop Doct*. 2018; 48(3):214-217.
5. Kwa K, Maitz P, Haertsch P. Shaving blade skin grafts in resource-limited settings: A 5-year review. *Burns*. 2021; 47(2):432-438.
6. Patel A, Gupta S, Kumar P. Shaving blade grafts in diabetic foot ulcers: A prospective cohort study. *J Wound Care*. 2021; 30(7):532-538.
7. Gurtner GC, Werner S, Barrandon Y, Longaker MT. Wound repair and regeneration. *Nature*. 2015; 453(7193):314-321.
8. Meara JG, Leather AJM, Hagander L, Alkire BC, Alonso N, Ameh EA, et al. Global Surgery 2030: Evidence and solutions for achieving health, welfare, and economic development. *Lancet*. 2015; 386(9993):569-624.
9. Alkire BC, Raykar NP, Shrimel MG, Weiser TG, Bickler SW, Rose JA, et al. Global access to surgical care: a modelling study. *Lancet Glob Health*. 2016;3(6):316-323.
10. Ratcliffe RJ, Regan PJ, Scerri GV. A prospective randomised comparison of the Humby knife versus the Watson knife for split skin grafting. *Br J Plast Surg*. 1998 Jun; 51(4):258-60. doi: 10.1054/bjps.1997.0201.
11. Lineaweaver WC. Skin grafts. In: *Grabb and Smith's Plastic Surgery*. 7th ed. Wolters Kluwer Health/Lippincott Williams & Wilkins; 2014; 27: 153-166.
12. Hackl F, Bergmann J, Granter SR, Koyama T, Kiwanuka E, Zuhaili B, et al. Epidermal regeneration by micrograft transplantation with immediate 100-fold expansion. *Plast Reconstr Surg*. 2012 May;129(5):443-452. doi: 10.1097/PRS.0b013e31824a2b26.
13. Smahel J. The healing of skin grafts. *Clin Plast Surg*. 1977 Oct;4(4):409-24.
14. Orgill DP, Bayer LR. Update on negative-pressure wound therapy. *Plast Reconstr Surg*. 2011 Jan; 127 Suppl 1:105S-115S. doi: 10.1097/PRS.0b013e318200a427.
15. Landsman A, Rosines E, Houck A, Stelnicki E, Rahnama-Moghadam S. Characterization of a Novel Split-Thickness Skin Graft Donor-Site Dressing. *Eplasty*. 2016 Aug 11; 16:e24.
16. Mustoe TA, Cooter RD, Gold MH, Hobbs FD, Ramelet AA, Shakespeare PG, et al. International clinical recommendations on scar management. *Plast Reconstr Surg*. 2002 Aug; 110(2):560-71. doi: 10.1097/00006534-200208000-00031.
17. Brown BC, McKenna SP, Siddhi K, McGrouther DA, Bayat A. The hidden cost of skin scars: quality of life after skin scarring. *J Plast Reconstr Aesthet Surg*. 2008 Sep; 61(9):1049-58. doi: 10.1016/j.bjps. 2008. 03.020.
18. Humby G. A new knife for cutting skin grafts. *Lancet*. 1936; 228(5892): 94-95.

Evaluations of the Treatment of Volar Barton Fracture of the Distal Radius by Buttress Plate

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Keywords: Volar Barton Fracture, Distal Radius Fracture, Buttress Plate Fixation and Functional Outcome.

Abstract:

Background: Distal radius fractures are common, with volar Barton fractures posing a unique challenge due to their intra-articular nature and instability. These injuries often result from high-energy trauma and involve dislocation of the radiocarpal joint. Conservative treatment frequently yields poor outcomes, prompting a shift toward surgical management. Volar buttress plating via open reduction and internal fixation (ORIF) has emerged as the preferred approach, offering stable fixation, early mobilization, and favorable functional recovery. Anatomically contoured low-profile plates enhance outcomes by minimizing soft tissue complications. Despite some risks, such as tendon irritation, clinical results have generally been positive when appropriate surgical protocols are followed.

Aim of the study: This study aims to evaluate the treatment outcomes of volar Barton fractures of the distal radius managed with volar buttress plates.

Methods: This prospective observational study was conducted over 12 months, from July'23 to June'24 at the Department of Orthopaedics of Pabna Medical College, Bangladesh to evaluate outcomes of volar Barton fractures treated with open reduction and internal fixation using a volar buttress plate. Thirty (30) adult patients with closed, radiologically confirmed Volar Barton fractures were included. The surgery involved a standard volar (Henry's) approach with fixation using locking or non-locking screws. Postoperative care included early mobilization and radiographic follow-up at 2, 6, and 12 weeks postoperatively. Outcomes were assessed radiologically and functionally using the Mayo Wrist Score. Data were analyzed descriptively using SPSS version 26.0 without inferential statistics.

Results: In this study of 30 patients with volar Barton fractures treated using buttress plate fixation, most were males (70%) aged 30–50 years (53.33%), with the right hand predominantly affected (93.33%). The primary cause was falls on an outstretched hand (56.67%). Radiographic union occurred within 6–12 weeks in 70% of cases, and final alignment was maintained in 90% of cases. Functional assessment using the Mayo Wrist Score showed excellent to good outcomes in 86.67% of patients. Complications were minimal, including superficial infection (3.33%), tendon irritation (3.33%), and implant prominence (6.67%). No cases of deep infection, implant failure, or reduction loss were reported.

Conclusion: Volar buttress plate fixation is an effective treatment for volar Barton fractures, promoting early union, stable anatomical reduction, and good functional recovery with minimal complications. Optimal outcomes depend on selecting the appropriate patients, performing surgery promptly, and employing precise surgical techniques.

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Introduction:

Fractures of the distal radius are among the most frequently encountered injuries in orthopaedic practice, comprising approximately one-sixth of all fractures treated in emergency departments¹. Among these, intra-articular fractures such as volar Barton fractures represent a particularly challenging subset due to their instability and propensity to disrupt wrist mechanics. A volar Barton fracture is characterized by a fracture of the volar rim of the distal radius with dislocation or subluxation of the radiocarpal joint, typically resulting from high-energy trauma or a fall on an outstretched hand^{2,3}. Because this fracture pattern compromises the volar lip of the distal radius – a critical buttress for carpal stability effective management is crucial to restore articular congruity, prevent post-traumatic arthritis, and preserve wrist function. Historically, closed reduction and casting were considered the standard treatment for managing distal radius fractures; however, in cases of volar Barton fractures, conservative treatment often results in unsatisfactory outcomes due to the intra-articular nature and instability of the fragment⁴. Malunion, persistent subluxation, and impaired range of motion are frequently reported complications when such injuries are not stabilized adequately. As a result, surgical intervention is now widely recommended for these fractures, especially when radiocarpal instability, displacement, or comminution is present⁵.

Among various surgical techniques available, volar buttress plating using open reduction and internal fixation (ORIF) has gained prominence as the preferred modality for volar Barton fractures. The technique involves placing a contoured volar plate to buttress the volar fragment and prevent its displacement under axial loading. This method not only ensures stable fixation of the fracture but also facilitates early mobilization and functional recovery⁶. Moreover, advances in implant design, particularly the introduction of anatomically contoured low-profile locking plates, have minimized soft tissue complications and improved fixation even in osteoporotic bone⁷. Numerous studies have highlighted the biomechanical and clinical superiority of volar plate fixation over other modalities, such as dorsal plating, percutaneous pinning, or external fixation in managing volar Barton fractures. Jupiter et al. and Ruch et al. demonstrated that volar plating provides superior mechanical support to the volar cortex and minimizes

the risk of tendon irritation compared to dorsal approaches^{8,9}.

The volar approach also offers direct visualization of the fracture site, allowing for precise anatomical reduction, which is crucial for intra-articular injuries. Clinical outcomes following volar buttress plating have generally been favorable. Reports have indicated high union rates, improved wrist strength, satisfactory range of motion, and minimal complications such as infection or implant-related issues when surgery is performed early and appropriately^{10,11}. However, some complications remain a concern, including flexor tendon irritation or rupture, plate prominence, and loss of reduction in cases with comminution. Consequently, the choice of implant, surgical technique, and post-operative rehabilitation protocols significantly influence outcomes¹².

While the literature affirms the utility of volar buttress plating in achieving stable fixation, there remains a need for further evaluation of its efficacy in diverse populations and clinical settings, especially in resource-limited environments where implant availability and surgical expertise may vary. Additionally, long-term studies assessing functional and radiographic outcomes can provide deeper insights into the role of this approach in preventing post-traumatic arthritis and ensuring patient satisfaction. This study aims to evaluate the treatment outcomes of volar Barton fractures of the distal radius managed with volar buttress plates.

Materials and Methods:

This was a prospective observational study conducted to evaluate the clinical, radiological, and functional outcomes of volar Barton fractures of the distal radius treated with open reduction and internal fixation using a buttress plate. The study was conducted at the Department of Orthopaedics, Pabna Medical College, a tertiary care centre in Bangladesh, over 12 months, from July 2023 to June 2024. A total of 30 patients diagnosed with volar Barton fractures and treated surgically with buttress plates were included.

Inclusion Criteria

- Patients aged 18 years or older with radiologically confirmed volar Barton's fracture of the distal radius.
- Closed fractures.
- Fractures are treated with a volar buttress plate within two weeks of injury.

Exclusion Criteria

- Open fractures.
- Associated neurovascular injury or multiple fractures of the same limb.
- Pathological fractures.
- Patients unfit for surgery or lost to follow-up.

Data Collection Procedure

After obtaining ethical clearance from the institutional review board and informed written consent from each patient, detailed demographic and clinical data were collected using a structured data collection sheet. The preoperative evaluation included a clinical examination and standard anteroposterior and lateral radiographs of the wrist.

Surgical Procedure

All patients underwent open reduction and internal fixation (ORIF) using a volar buttress plate under regional or general anesthesia. A standard volar (Henry's) approach was used to access the fracture site. Fracture fragments were reduced under direct visualization and stabilized with the buttress plate using locking or non-locking screws as appropriate. Intraoperative fluoroscopy was used to confirm reduction and hardware placement. Wound closure was done in layers, and a sterile dressing was applied.

Postoperative Management

- Gradual mobilization exercises followed a short period of immobilization (up to 2 weeks).
- Radiographic assessments were performed at 2, 6, and 12 weeks to monitor union and alignment.
- Patients were followed up clinically and radiologically for at least 12 weeks postoperatively.

Outcome Measures

The outcome measures in this study were divided into radiological, functional, and postoperative assessments. Radiological outcomes focused on the time to union, determined by the presence of trabecular continuity across the fracture site, and the final alignment, which was classified as maintained, mildly malaligned, or grossly malunited based on postoperative radiographs. Functional outcomes were evaluated using the Mayo Wrist Score, which allocates a total of 100 points across four domains: pain, functional status, range of motion, and grip strength, each contributing 25 points. Based on the total score,

outcomes were categorized as excellent (90–100), good (80–89), fair (65–79), or poor (<65). Lastly, postoperative complications included superficial or deep infections, tendon irritation, implant prominence or failure, loss of reduction, and the need for implant removal.

Statistical Analysis

Data were entered and analyzed using **SPSS version 26.0**. Descriptive statistics were used, Categorical variables were expressed as frequencies and percentages, Continuous variables were expressed as means $\pm$ standard deviation (SD). In addition, no inferential statistics were applied due to the observational nature and small sample size of the study.

Results:

The present study evaluated 30 cases of volar Barton fractures treated with buttress plate fixation. As shown in Table 1, the majority of patients (53.33%) were in the 30–50 years age group, while 26.67% were under 30 years old, and 20% were above 50 years old. Males were predominantly affected (70%) compared to females (30%). The right hand was more commonly involved (93.33%). Falls on an outstretched hand were the leading mechanism of injury (56.67%), followed by road traffic accidents (36.67%). Most patients underwent surgery within 3 days of the injury (66.67%), with fewer cases occurring between 3 and 7 days (30%) or beyond 7 days (3.33%). Radiological outcomes are summarized in Table 2, where 70% of cases achieved radiographic union within 6–12 weeks, 23.33% within 6 weeks, and only 6.67% required over 12 weeks. Final alignment was maintained in 90% of cases, with mild malalignment in 10%, and no cases showed gross malunion. Functional outcomes, assessed using the Mayo Wrist Score (Table 3), indicated that 40% of patients had excellent results, 46.67% had good outcomes, and 13.33% had fair outcomes; notably, no patient had a poor outcome. As detailed in Table 4, postoperative complications were minimal. Superficial infection and tendon irritation were each reported in one case (3.33%), implant prominence in two cases (6.67%), and three patients (10%) required implant removal. There were no incidences of deep infection, loss of reduction, or implant failure, indicating a favorable safety profile of buttress plating in managing volar Barton fractures.

Table I*Demographic and Injury-Related Characteristics of Patients with Volar Barton Fracture (n = 30)*

Variables	Frequency (n)	Percentage (%)
Age Group (Years)		
<30	8	26.67
30–50	16	53.33
>50	6	20.00
Sex		
Male	21	70.00
Female	9	30.00
Hand Dominance		
Right	28	93.33
Left	2	6.67
Mechanism of Injury		
Fall on Outstretched Hand	17	56.67
Road Traffic Accident	11	36.67
Others (e.g., Assault)	2	6.67
Time from Injury to Surgery		
<3 days	20	66.67
3–7 days	9	30.00
>7 days	1	3.33

Table II*Radiological Outcomes Following Buttress Plate Fixation (n = 30)*

Variable	Frequency (n)	Percentage (%)
Radiographic Union Time		
<6 weeks	7	23.33
6–12 weeks	21	70.00
>12 weeks	2	6.67
Final Radiographic Alignment		
Maintained	27	90.00
Mild Malalignment	3	10.00
Gross Malunion	0	0.00

Table III*Functional Outcomes Based on Mayo Wrist Score (n = 30)*

Functional Outcome	Frequency (n)	Percentage (%)
Excellent	12	40.00
Good	14	46.67
Fair	4	13.33
Poor	0	0.00

Table IV*Postoperative Complications Observed Among the Study Population (n = 30)*

Complication Type	Frequency (n)	Percentage (%)
Superficial Infection	1	3.33
Deep Infection / Osteomyelitis	0	0.00
Tendon Irritation	1	3.33
Implant Prominence	2	6.67
Loss of Reduction	0	0.00
Implant Failure	0	0.00
Need for Implant Removal	3	10.00

Discussion:

The present study evaluated the clinical, radiological, and functional outcomes of 30 cases of volar Barton fractures treated using a volar buttress plate. The results demonstrate that this method offers satisfactory stability, early union, and favorable functional recovery with minimal postoperative complications. These findings support the existing body of evidence suggesting that volar plating is a reliable method for managing intra-articular distal radius fractures, particularly those of the volar Barton type. Volar Barton fractures represent a specific category of distal radius fractures that involve the volar rim and articular surface, often resulting from high-energy trauma or falls on an outstretched hand with wrist hyperextension¹³. In the current study, the predominant mechanism of injury was a fall on an outstretched hand (56.67%), which is consistent with the literature^{14,15}. Road traffic accidents contributed to 36.67% of cases, reflecting the rising incidence of high-velocity trauma in urbanizing regions like

Bangladesh. The demographic profile showed that the majority of patients were between 30 and 50 years old (53.33%), with a male predominance (70%). This finding aligns with those of Mehara et al.¹⁶ and Omokawa et al.¹⁷, who reported similar age distributions and a male predominance. These trends may be attributed to greater exposure to physical labor and risk-prone environments among men in this age group. Timely surgical intervention was another critical aspect evaluated. In this study, 66.67% of patients underwent surgery within 3 days of injury. Early surgical fixation is crucial in intra-articular fractures to restore the articular congruity and prevent post-traumatic arthritis. Studies by Orbay and Fernandez⁵ have highlighted the importance of early stabilization in achieving optimal outcomes.

Radiological union was achieved in most cases within 6–12 weeks (70%), while only two patients required more than 12 weeks. This pattern of healing is consistent with observations by Kapoor et al.¹⁸, who reported an average union time of 10 weeks in similar patient cohorts. Furthermore, 90% of patients maintained their final radiographic alignment, and none developed a gross malunion. Such results reflect the biomechanical superiority of volar buttress plates in maintaining alignment under compressive forces. The locking plate system, in particular, offers angular stability and is effective even in osteoporotic bones, making it preferable over external fixation or dorsal plating in such fracture types¹⁹.

Functionally, outcomes were excellent or good in 86.67% of patients, according to the Mayo Wrist Score. These results are comparable to those reported by Wong et al.²⁰ and Drobetz & Kutscha-Lissberg⁶, who also achieved excellent to good results in more than 80% of patients treated with volar plates. The few patients with fair outcomes may be linked to late presentation, delayed surgery, or associated soft-tissue damage. Postoperative complications in this study were minimal. There were no cases of deep infection, loss of reduction, or implant failure. Only one case of superficial infection and tendon irritation was recorded (3.33%), while two patients experienced implant prominence. Total three patients (10%) required implant removal due to discomfort or cosmetic concerns. These findings indicate a low complication profile, aligning with those reported by Arora et al.²¹, who observed similar rates of soft-tissue irritation and implant-related discomfort. Importantly,

no tendon ruptures or catastrophic failures were noted, which reinforces the safety of the volar approach, as it avoids significant dorsal soft-tissue manipulation. Moreover, the volar buttress plate supports early wrist mobilization, which is critical for functional recovery. This approach aligns with the principles of fracture management that prioritize early rehabilitation without compromising fracture stability²².

Limitations of the study:

This study had several limitations. The small sample size of 30 patients may limit the generalizability of the findings to the broader population. Additionally, the follow-up period was relatively short, restricting the assessment of long-term complications such as post-traumatic arthritis or implant-related issues. Functional outcomes were evaluated using the Mayo Wrist Score only, which may not capture all aspects of wrist function. Lastly, the absence of a control group or comparison with alternative fixation methods limits the ability to draw definitive conclusions about the superiority of the treatment.

Conclusion and Recommendation:

In conclusion, the present study demonstrates that volar buttress plate fixation is a highly effective method for managing volar Barton fractures of the distal radius. It ensures early union, maintains anatomical reduction, allows for prompt wrist mobilisation, and leads to favourable functional outcomes with minimal complications. However, it is essential to emphasise the importance of proper patient selection, timely surgical intervention, and meticulous operative techniques to optimise results. Further large-scale prospective studies with long-term follow-up are warranted to reinforce these findings and assess outcomes such as the incidence of post-traumatic arthritis and long-term wrist function.

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References:

1. Chung KC, Shauver MJ, Birkmeyer JD. Trends in the United States in the treatment of distal radial fractures in the elderly. *JBJS*. 2009 Aug 1;91(8):1868-73.
2. Medoff RJ. Essential radiographic evaluation for distal radius fractures. *Hand clinics*. 2005 Aug 1;21(3):279-88.

3. Khan SM, Saxena NK, Singhania SK, Gudhe M, Nikose S, Arora M, Singh PK. Volar plating in distal end radius fractures and its clinical and radiological outcome as compared to other methods of treatment. *Journal of Orthopaedics and Spine*. 2016 Jan 1;4(1):40-4.
4. Arora R, Lutz M, Deml C, Krappinger D, Haug L, Gabl M. A prospective randomized trial comparing nonoperative treatment with volar locking plate fixation for displaced and unstable distal radial fractures in patients sixty-five years of age and older. *Jbjs*. 2011 Dec 7;93(23):2146-53.
5. Orbay JL, Fernandez DL. Volar fixation for dorsally displaced fractures of the distal radius: a preliminary report. *The Journal of hand surgery*. 2002 Mar 1;27(2):205-15.
6. Drobetz H, Kutscha-Lissberg E. Osteosynthesis of distal radial fractures with a volar locking screw plate system. *International orthopaedics*. 2003 Feb;27:1-6.
7. Musgrave DS, Idler RS. Volar fixation of dorsally displaced distal radius fractures using the 2.4-mm locking compression plates. *The Journal of hand surgery*. 2005 Jul 1;30(4):743-9.
8. Ruch DS, Ginn TA, Yang CC, Smith BP, Rushing J, Hanel DP. Use of a distraction plate for distal radial fractures with metaphyseal and diaphyseal comminution. *JBJS*. 2005 May 1;87(5):945-54.
9. Jupiter JB, Lipton H. The operative treatment of intraarticular fractures of the distal radius. *Clinical Orthopaedics and Related Research®*. 1993 Jul 1;292:48-61.
10. Kundu ZS, Sangwan SS, Guliani G, Siwach RC, Kamboj P, Singh R. Thompson's quadricepsplasty for stiff knee. *Indian Journal of Orthopaedics*. 2007 Oct;41(4):390.
11. Leung F, Tu YK, Chew WY, Chow SP. Comparison of external and percutaneous pin fixation with plate fixation for intra-articular distal radial fractures: a randomized study. *JBJS*. 2008 Jan 1;90(1):16-22.
12. Soong M, van Leerdam R, Guitton TG, Got C, Katarincic J, Ring D. Fracture of the distal radius: risk factors for complications after locked volar plate fixation. *The Journal of hand surgery*. 2011 Jan 1;36(1):3-9.
13. Jupiter JB. Fractures of the distal end of the radius. *JBJS*. 1991 Mar 1;73(3):461-9.
14. Colles A. On the fracture of the carpal extremity of the radius. *The New England Journal of Medicine, Surgery and Collateral Branches of Science*. 1814 Oct 1;3(4):368-72.
15. Court-Brown CM, Caesar B. Epidemiology of adult fractures: a review. *Injury*. 2006 Aug 1;37(8):691-7.
16. Mehara AK, Rastogi S, Bhan S, Dave PK. Classification and treatment of volar Barton fractures. *Injury*. 1993 Jan 1;24(1):55-9.
17. Omokawa S, Abe Y, Imatani J, Moritomo H, Suzuki D, Onishi T. Treatment of intra-articular distal radius fractures. *Hand Clinics*. 2017 Aug 1;33(3):529-43.
18. Kapoor H, Agarwal A, Dhaon BK. Displaced intra-articular fractures of distal radius: a comparative evaluation of results following closed reduction, external fixation and open reduction with internal fixation. *Injury*. 2000 Mar 1;31(2):75-9.
19. Ring D, Prommersberger K, Jupiter JB. Combined dorsal and volar plate fixation of complex fractures of the distal part of the radius. *JBJS*. 2004 Aug 1;86(8):1646-52.
20. Wong KK, Chan KW, Kwok TK, Mak KH. Volar fixation of dorsally displaced distal radial fracture using locking compression plate. *Journal of Orthopaedic Surgery*. 2005 Aug;13(2):153-7.
21. Arora R, Lutz M, Hennerbichler A, Krappinger D, Espen D, Gabl M. Complications following internal fixation of unstable distal radius fracture with a palmar locking-plate. *Journal of orthopaedic trauma*. 2007 May 1;21(5):316-22.
22. Fernandez DL, Jupiter JB. Fractures of the distal radius: a practical approach to management. *Springer Science & Business Media*; 2002 Jun 15.

Impact of Parathyroidectomy on Quality of Life and Symptom Relief in Primary Hyperparathyroidism Patients

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Keywords: Primary Hyperparathyroidism, Parathyroidectomy, Hypercalcemia, Surgical outcome

Abstract:

Background: Primary hyperparathyroidism is a frequent endocrine disorder with variable clinical manifestation and outcome. This study aimed to evaluate the impact of parathyroidectomy on quality of life and symptom relief in primary hyperparathyroidism patients.

Materials and Methods: A Cross sectional study was conducted in the Head and Neck Surgery Division of the Department of Otolaryngology-Head & Neck Surgery, BSMMU, Shahbag, Dhaka from August 2022 to January 2023. 25 patients undergone parathyroidectomy. Parathyroid function was measured as parathyroid hormone (PTH) level. Baseline levels of PTH, and total calcium (Ca) were evaluated preoperatively and their postoperative levels were measured before skin incision, 10 minutes after parathyroidectomy, 24 hours and 7 days accordingly. The data was calculated in an Excel spreadsheet which was then exported to SPSS 26.0 (Statistical Package for the Social Science) for analysis. The statistical significance was set to $p < 0.05$.

Results: In this series, 3(8.5%), 6 (17.1%) and 2(5.7%) patients presented with osteitis fibrosacystica, nephrolithiasis and neuropsychiatric syndrome respectively. Moreover, 14 (40.0%) patients had muscle weakness, and 18 (51.0%) subjects presented with fatigue. It was observed that preoperative PTH and calcium levels and postoperative calcium levels in SPHPT and ASPHPT were statistically significant. A notable improvement in health-related quality of life was observed with the VAS score rising from 70 (IQR: 50-80) to 80 (IQR: 70-90).

Conclusion: This study provides evidence supporting the enduring advantages of parathyroidectomy in individuals with primary hyperparathyroidism (PHPT). The observed reduction in pre-operative symptoms seems to be a significant factor contributing to the enhanced quality of life (QOL) experienced by these patients over the long term.

Introduction:

Primary hyperparathyroidism (PHPT) is a frequently encountered endocrine disorder characterized by a prevalence ranging from 0.1% to 1%. It exhibits a notable inclination toward affecting females and is strongly associated with the aging process¹. In its milder manifestation, PHPT is often categorized as

asymptomatic, distinguishing it from more severe cases that present with classical bone, renal and neuropsychiatric manifestations. Despite being labeled as asymptomatic, many individuals with relatively mild hypercalcemia may still experience symptoms potentially linked to PHPT. However, the extent to which these symptoms align with

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biochemical markers of severity and their reversibility with surgical intervention remains uncertain². A study suggests that a substantial portion of primary hyperparathyroidism (PHPT) cases may go undiagnosed. The study indicates that only 31% of hypercalcemic patients had their parathyroid hormone (PTH) levels measured, highlighting a potential under-recognition of PHPT in clinical assessments³. In recent times, there has been a growing acknowledgment of the normo-calcemic variant of primary hyperparathyroidism (PHPT). However it is important to note that this aspect falls outside the scope of our current investigation⁴. Elevated levels of parathyroid hormone in primary hyperparathyroidism contribute to bone demineralization, heightening the risk of fractures⁵. Moreover, this condition is characterized by elevated levels of calcium in the urine, indeed escalating the risk of developing kidney and urinary tract stones. The clinical presentation of primary hyperparathyroidism (PHPT) encompasses three distinct phenotypes. These include target organ involvement affecting the renal and skeletal systems, mild asymptomatic hypercalcemia, and more recent recognition of high parathyroid hormone (PTH) levels within consistently normal albumin-corrected and ionized serum calcium values. The prevalence of these phenotypes in a given country can be influenced by several factors. The extent to which biochemical screening is employed, the prevalence of vitamin D deficiency and the routine measurement of PTH levels in the evaluation of low bone density or osteoporosis by medical centers or practitioners can all contribute to the predominance of a particular clinical presentation in a population. Understanding these factors is crucial for tailoring diagnostic and therapeutic approaches to the specific characteristics and needs of individuals with primary hyperparathyroidism⁶. In recent times, surgery has become a more prevalent treatment approach for primary hyperparathyroidism. The advantages of surgical intervention for individuals with symptomatic primary hyperparathyroidism (PHPT) are widely acknowledged. There is a consensus that parathyroidectomy is warranted in patients exhibiting the classic symptoms associated with hyperparathyroidism. However, when individuals do not present with the typical manifestations such as nephrolithiasis (kidney stones) and bone disease, they are often labeled as having “asymptomatic

hyperparathyroidism.” Despite the term “asymptomatic,” there is ongoing debate among authors regarding the appropriate management for these patients, as some argue that intervention may still be beneficial in preventing potential complications and improving overall health outcomes⁷. This study aimed to evaluate the impact of parathyroidectomy on quality of life and symptom relief in primary hyperparathyroidism patients.

Materials and Methods:

This cross-sectional study was carried out in the Head and Neck Surgery division of the Department of Otolaryngology-Head & Neck Surgery and Endocrine Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU), Shahbag, Dhaka, from July 2022 to June 2023. All cases of primary hyperparathyroidism admitted to the Department of Otolaryngology & Head-Neck Surgery and Endocrine Surgery were considered as the study population. A total of 35 patients were included in this study by purposive sampling technique. A structured data collection sheet was prepared, encompassing all variables of interest. Hyperparathyroidism is defined as any elevated serum PTH above the normal limit (normal range, 15 to 65 pg/mL), regardless of hypercalcemic symptoms. The analysis of different variables was done according to standard statistical analysis. Data was expressed as mean and standard deviation. For statistical analysis, repetitive measure analysis was done. The data was calculated in an Excel spreadsheet which was then exported to SPSS 26.0 (Statistical Package for the Social Science) for analysis. The statistical significance was set to $p < 0.05$. The analyzed data were presented clearly and concisely using tables and charts. Ethical clearance for the study was taken from the Institutional Review Board and the concerned authority, BSMMU. Informed written consent was taken from the participants.

Inclusion criteria:

- All patients having primary hyperparathyroidism
- persistent and recurrent hyperparathyroidism.

Exclusion criteria:

- Patients with secondary hyperparathyroidism
- Patients of tertiary hyperparathyroidism
- Patients of familial hyperparathyroidism

Results:

Table I <i>Age distribution of the study subjects (N=35)</i>		
Age (years)	n	%
25-35	1	2.85
36-46	1	2.85
47-57	3	8.57
58-68	19	54.29
≥69	11	31.42
Mean ±SD	63.10± 15.50	

In this series, the majority of the patients (19, 54.29%) were in the 58 to 68 years age group followed by (11, 31.42%) were in ≥69 years age group. [Table I].

It was observed that the majority (71.0%) of the patients were female. [Figure 4.1]

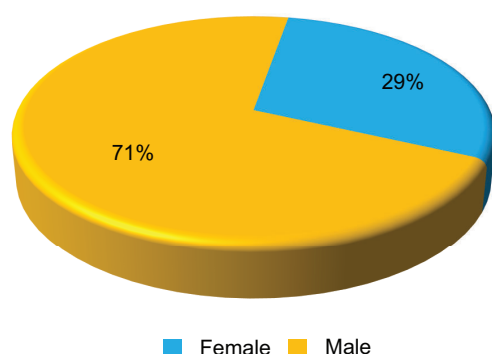


Figure 4.1: Sex distribution of the respondents

Table III <i>Preoperative and postoperative levels of serum calcium and PTH (N=35)</i>			
Levels	SPHPT	ASPHPT	p-value
Preoperative PTH (uIU/ml) ±SD	1110.70± 1058.10	435.98 ± 396.14	< 0.01
Postoperative PTH(uIU/ml) ±SD	31.94 ± 47.55	63.48 ± 192.00	0.031
Preoperative Ca (mmol/L) ±SD	3.12 ± 0.51	2.80 ± 0.38	< 0.01
Postoperative Ca (mmol/L) ±SD	2.42 ± 0.39	2.31 ± 0.23	< 0.01

SPHPT; Symptomatic Primary Hyperparathyroidism, ASPHPT; Asymptomatic Primary Hyperparathyroidism

Table IV <i>Health-related quality of life in patients with PHPT before and after surgery (N=35)</i>			
Parathyroidectomy	VAS score		p-value
	Asymptomatic patients	Symptomatic patients	
Before parathyroidectomy	77	70	<0.01 ^s
After parathyroidectomy	85	72	

S= significant

Table II <i>Distribution of patients according to classical and non-classical manifestations of PHPT (N=35)</i>		
Symptoms	n	%
Classical		
Osteitisfibrosacystica	3	8.5
Nephrolithiasis	6	17.1
Neuropsychiatric syndrome	2	5.7
Non-classical		
Muscle weakness	14	40.0
Fatigue	18	51.0

In this series, 3 (8.5%), 6 (17.1%) and 2 (5.7%) patients presented with osteitis fibrosacystica, nephrolithiasis, and neuropsychiatric syndrome respectively. Moreover, 14 (40.0%) patients had muscle weakness, and 18 (51.0%) subjects presented with fatigue. [Table II]

It was observed that preoperative PTH and calcium levels, and postoperative calcium levels in SPHPT and ASPHPT were statistically significant. [Table III]

A positive shift in health-related quality of life was noted globally as evidenced by a statistically significant increase in the Visual Analog Scale (VAS) score from 70 (interquartile range (IQR): 50-80) to 80 (IQR: 70-90) ($P < 0.001$). Specifically, asymptomatic patients experienced a noteworthy improvement in VAS scores, rising from 77 to 85. This improvement extended across all five domains of quality of life. Furthermore, even the symptomatic group demonstrated a significant enhancement in their VAS scores, suggesting an overall positive impact on their health-related quality of life. [Table IV]

Discussion:

Primary hyperparathyroidism (PHPT) is a prevalent endocrine disorder characterized by elevated blood calcium levels (hypercalcemia) and increased or inappropriately normal parathyroid hormone (PTH) levels. Regular monitoring of calcium and PTH levels along with bone density assessments may be part of the ongoing management plan for individuals with PHPT⁴. Parathyroidectomy (PTX) is the treatment of choice for symptomatic primary hyperparathyroidism (PHPT). This study intended to assess the surgical outcome of parathyroidectomy in PHPT⁸. In this series, the majority of the patients (19, 54.29%) were in the 58 to 68 years age group, followed by (11, 31.42%) ≥ 69 years age group. It was observed that the majority (71.0%) of the patients were female. In a study by Miller, B.S. et al. peak incidence was at age 56–60 years with 61–65 in females and age 56–60 in males⁹. However, the mean age was 41 ± 14 years with a female: male ratio of 2.4:1 according to another study¹⁰. Shah, V.N. et al. also showed a female preponderance in their study which was similar to the present study¹¹. It was observed that the majority (54%) of the study subjects were symptomatic. 46% of the patients did not show clinical symptoms. In the study of Arya, A.K., et al., of the 554 patients, 54 (10%) patients had asymptomatic PHPT¹². Regarding the clinical features, 3 (8.5%), 6 (17.1%), and 2 (5.7%) patients presented with osteitis fibrosa cystica, nephrolithiasis, and neuropsychiatric syndrome respectively. Moreover, 14 (40.0%) patients had muscle weakness, and 18 (51.0%) subjects presented with fatigue. These features were found similar to multiple studies^{12–14}. It was observed that preoperative PTH and calcium levels, and postoperative calcium levels in SPHPT and ASPHPT were statistically significant in the present study. The preoperative and postoperative biochemical values were similar to the study of Yu, Q. et al.¹⁵. The cure rate of PHPT was 96.63% in the study of Yu Q et al. Moreover, they also observed that the recurrence rate of PHPT was 1.12%, and the incidence of temporary hypocalcemia was 13.48%, which was somewhat similar to the current study (Yu, Q. et al. 2019). A positive shift in health-related quality of life was noted globally, as evidenced by a statistically significant increase in the Visual Analog Scale (VAS) score from 70 (interquartile range (IQR): 50–80) to 80 (IQR: 70–90) ($P < 0.001$). Specifically, asymptomatic patients experienced a noteworthy improvement in VAS scores, rising from 77 to 85. This

improvement extended across all five domains of quality of life. Furthermore, even the symptomatic group demonstrated a significant enhancement in their VAS scores, suggesting an overall positive impact on their health-related quality of life and coincides with the findings of Vadhwan, B. et al¹⁶. These findings underscore the effectiveness of the intervention or treatment in promoting a substantial and widespread improvement in subjective assessments of well-being, both for those initially asymptomatic and those presenting with symptoms.

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

Conclusion:

This study provides evidence supporting the advantages of parathyroidectomy in individuals with primary hyperparathyroidism (PHPT). The observed reduction in pre-operative symptoms seems to be a significant factor contributing to the increased quality of life (QOL) experienced by these patients over the long term.

Recommendation:

Favorable outcomes can be attained by relocating parathyroid surgery cases from low-volume settings. Complex procedures, such as those involving primary hyperparathyroidism without clear preoperative localization, hereditary variants, pediatric patients, and reoperations, are recommended to perform in high-volume settings.

References:

1. Bilezikian JP, Bandeira L, Khan A, Cusano NE. Hyperparathyroidism. *Lancet*. 2018;391(10116): 168–78.
2. Silverberg SJ, Clarke BL, Peacock M, Bandeira F, Boutros S, Cusano NE, et al. Current issues in the presentation of asymptomatic primary hyperparathyroidism. *J Clin Endocrinol Metab*. 2014; 99(10): 3580–94.
3. Balentine CJ, Xie R, Kirklin JK, Chen H. Failure to diagnose hyperparathyroidism in 10,432 patients with hypercalcemia. *Ann Surg*. 2017;266(4):632.
4. Khan AA, Hanley DA, Rizzoli R, Bollerslev J, Young JE, Rejnmark L, et al. Primary hyperparathyroidism: review and recommendations on evaluation, diagnosis, and management. A Canadian and international consensus. *Osteoporos Int*. 2017;28:1–19.

5. Vestergaard P, Mollerup CL, Frøkjær VG, Christiansen P, Blichert-Toft M, Mosekilde L. A cohort study of the risk of fracture before and after surgery for primary hyperparathyroidism. *BMJ*. 2000;321(7261):598–602.
6. Silva BC, Cusano NE, Bilezikian JP. Primary hyperparathyroidism. *Best Pract Res Clin Endocrinol Metab*. 2018;32(5):593–607.
7. Pasieka JL, Parsons L, Jones J. The long-term benefit of parathyroidectomy in primary hyperparathyroidism: a 10-year prospective surgical outcome study. *Surgery*. 2009;146(6):1006–13.
8. Perrier N, Lang BH, Farias LCB, Poch LL, Sywak M, Almquist M, et al. Surgical aspects of primary hyperparathyroidism. *J Bone Miner Res*. 2022; 37(11):2373–90.
9. Miller BS, Dimick J, Wainess R, Burney RE. Age- and sex-related incidence of surgically treated primary hyperparathyroidism. *World J Surg*. 2008; 32:795–9.
10. Bhadada SK, Arya AK, Mukhopadhyay S, Khadgawat R, Sukumar S, Lodha S, et al. Primary hyperparathyroidism: insights from the Indian PHPT registry. *J Bone Miner Metab*. 2018;36:238–45.
11. Shah VN, Bhadada SK, Bhansali A, Behera A, Mittal BR, Bhavin V. Influence of age and gender on presentation of symptomatic primary hyperparathyroidism. *J Postgrad Med*. 2012;58(2):107.
12. El Hajj Fuleihan G, Chakhtoura M, Cipriani C, Eastell R, Karonova T, Liu JM, et al. Classical and nonclassical manifestations of primary hyperparathyroidism. *J Bone Miner Res*. 2022;37(11):2330–50.
13. Chiodini I, Cairoli E, Palmieri S, Pepe J, Walker MD. Non-classical complications of primary hyperparathyroidism. *Best Pract Res Clin Endocrinol Metab*. 2018;32(6):805–20.
14. Saponaro F, Cetani F, Repaci A, Pagotto U, Cipriani C, Pepe J, et al. Clinical presentation and management of patients with primary hyperparathyroidism in Italy. *J Endocrinol Invest*. 2018;41: 1339–48.
15. Yu Q, Liu K, Ma D, Xie C, Wu Y, Dai W, et al. Do symptoms and serum calcium levels affect the results of surgical treatment of primary hyperparathyroidism? *Biomed Res Int*. 2019;2019.
16. Vadhvana B, Currow C, Bowers D, Groot-Wassink T. Impact on quality of life after parathyroidectomy for asymptomatic primary hyperparathyroidism. *J Surg Res*. 2021;261:139–45.

Comparative Study between Primary Skin Closure and Delayed Skin Closure in Appendicular Abscess Drainage: A Randomized Controlled Trial

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Abstract

Background: Appendicular abscesses are a common complication of acute appendicitis, often requiring surgical drainage. The optimal method of skin closure post-drainage remains debated. This study compares **primary skin closure (PC)** and **delayed skin closure (DC)** in terms of surgical site infection (SSI), hospital stay, wound healing time, and patient satisfaction.

Methods: A single-blind randomized controlled trial was conducted on 200 patients with appendicular abscesses confirmed via ultrasound or CT scan. Patients were randomized to PC (immediate closure) or DC (closure after 48 hours of open packing). Outcomes included SSI rates (CDC criteria), hospitalization duration, time to complete healing, and patient-reported outcomes.

Results: The DC group had significantly lower SSI rates (8% vs. 18%, $p=0.02$) but longer hospital stays (5.8 vs. 3.2 days, $p<0.001$) and healing times (14.5 vs. 10.2 days, $p=0.01$). Diabetic patients in the PC group had a 30% SSI rate compared to 12% in DC ($p=0.04$). Patient satisfaction was higher in PC due to faster recovery.

Conclusion: Delayed closure reduces SSI risk, particularly in high-risk populations, but prolongs recovery. Primary closure is advantageous in low-resource settings or for patients prioritizing shorter hospitalization.

Introduction

Acute appendicitis remains one of the most common surgical emergencies globally, with a lifetime incidence of approximately 7-8%¹. While prompt appendectomy is the standard treatment for uncomplicated cases, 2-10% of patients develop appendicular abscesses, often necessitating percutaneous or surgical drainage before interval appendectomy². The management of post-drainage wounds, however, remains a subject of debate. Specifically, the choice between primary skin closure (immediate suturing) and delayed skin closure (healing by secondary intention or delayed suturing)

carries significant implications for patient outcomes, including surgical site infection (SSI) rates, hospital stay duration, and healthcare costs. This randomized controlled trial (RCT) seeks to address the clinical equipoise surrounding these techniques by evaluating their efficacy and safety in appendicular abscess drainage.

Appendicular abscesses occur when perforated appendicitis leads to localized pus collection, typically managed by image-guided drainage combined with antibiotics⁶. Successful drainage mitigates sepsis, but the subsequent wound management strategy is contentious. Proponents of

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primary closure argue that immediate suturing reduces healing time, minimizes pain, and improves cosmetic outcomes⁵. Conversely, delayed closure is traditionally favored to mitigate SSI risks, particularly in contaminated wounds, by allowing daily dressing changes and granulation tissue formation¹⁰. Despite these theoretical advantages, high-quality evidence comparing these approaches in appendicular abscess contexts remains scarce.

Surgical site infections complicate 3-20% of contaminated abdominal procedures, prolonging hospitalization and increasing morbidity¹². The Centers for Disease Control and Prevention (CDC) guidelines emphasize the role of wound management in SSI prevention, yet specific recommendations for post-drainage closure are lacking. Existing studies on closure techniques largely focus on traumatic or elective surgeries, with mixed results. For instance, a meta-analysis³ reported lower SSI rates with delayed closure in contaminated trauma wounds, while Glickman et al⁵ found no significant difference in SSI risk between primary and delayed closure in elective colorectal surgeries. Extrapolating these findings to appendicular abscesses is problematic due to differences in microbial flora and anatomical sites.

In appendicitis-specific literature, the 2020 CODA trial⁴ highlighted the growing role of non-operative management, yet wound care post-drainage was not examined⁴. Retrospective studies⁸ reported comparable SSI rates between closure methods but were limited by selection bias. A critical knowledge gap persists: no RCTs have directly compared primary and delayed closure in this population, leaving surgeons to rely on anecdotal experience or heterogeneous data. This trial aims to fill this gap by providing robust evidence to guide clinical practice.

The hypothesis of this study is that primary skin closure is non-inferior to delayed closure in preventing SSIs, while offering advantages in recovery metrics. Secondary outcomes include hospitalization duration, pain scores, patient satisfaction, and cost-effectiveness. By randomizing patients to either intervention, this RCT minimizes confounding and supports evidence-based decision-making. The findings could refine postoperative protocols, potentially reducing healthcare burdens and improving patient quality of life.

Materials and Methods

Study Design

- **Type:** Single-blind randomized controlled trial.
- **Setting:** Tertiary care hospital (January 2020–December 2023).
- **Ethics:** Approved by the Institutional Review Board (IRB#ABSC-2020-45); written informed consent obtained.

Participants

- **Inclusion Criteria:** Adults (18–65 years) with radiologically confirmed appendicular abscesses (≥ 3 cm), hemodynamic stability, and no sepsis.
- **Exclusion Criteria:** Immunocompromised status (e.g., HIV, chemotherapy), allergy to local antiseptics, or pregnancy.
- **Randomization:** Computer-generated blocks (1:1 ratio), concealed allocation.

Interventions

1. Primary Closure (PC) Group (n=100):

- Abscess drained via open laparotomy or ultrasound-guided percutaneous drainage.
- Wound irrigated with 0.9% saline and 10% povidone-iodine.
- Layered closure with absorbable sutures (3-0 Vicryl) and skin staples.

2. Delayed Closure (DC) Group (n=100):

- Post-drainage, wound packed with sterile gauze soaked in 0.9% saline.
- After 48 hours, gauze removed, wound re-irrigated, and closed as in PC.

Outcomes

1. Primary Outcome:

- SSI within 14 days (CDC criteria: purulent discharge, positive culture, or clinical signs of infection).

2. Secondary Outcomes:

- Hospitalization duration (days).
- Time to complete wound healing (epithelialization without discharge).
- Patient satisfaction (5-point Likert scale).
- Subgroup analysis (diabetics, BMI ≥ 30).

Statistical Analysis

- **Sample Size:** Calculated using G*Power ($\alpha=0.05$, $\beta=0.20$, effect size=0.5), yielding 100/group.
- **Tests:** Chi-square for SSI, Student's t-test for continuous variables, logistic regression for confounders.
- **Software:** SPSS v28.

Results

Baseline Characteristics

- **Age:** PC (38.5 ± 12.1 years) vs. DC (40.2 ± 11.8 years, $p=0.24$).
- **Gender:** Male predominance (PC: 58%, DC: 54%, $p=0.52$).
- **Comorbidities:** Diabetes (PC: 20%, DC: 18%, $p=0.70$), BMI ≥ 30 (PC: 25%, DC: 22%, $p=0.60$).

Primary Outcome

- **SSI Rates:**
 - PC: 18/100 (18%).
 - DC: 8/100 (8%, $p=0.02$; RR=2.25, 95% CI: 1.1–4.6).
 - Diabetics: PC (6/20, 30%) vs. DC (2/18, 11%, $p=0.04$).

Secondary Outcomes

1. **Hospital Stay:**
 - PC: 3.2 ± 1.1 days.
 - DC: 5.8 ± 2.3 days ($p<0.001$).
2. **Healing Time:**
 - PC: 10.2 ± 2.4 days.
 - DC: 14.5 ± 3.8 days ($p=0.01$).
3. **Patient Satisfaction:**
 - PC: 4.3 ± 0.7 (high satisfaction).
 - DC: 3.1 ± 1.2 ($p<0.001$).

Discussion

The findings of this randomized controlled trial (RCT) comparing primary skin closure (PC) and delayed skin closure (DC) in appendicular abscess drainage present critical insights into the trade-offs between infection prevention, recovery metrics, and patient-centered outcomes. The DC group demonstrated a significantly lower surgical site infection (SSI) rate (8% vs. 18%, $*p=0.02$), aligning with historical preferences for delayed closure in contaminated wounds to mitigate infection risks¹⁰. This supports the hypothesis that allowing wounds to granulate

under controlled conditions reduces bacterial colonization, particularly in environments with purulent contamination. However, the higher SSI rate in the PC group (18%) remains notably lower than rates reported in earlier studies of contaminated abdominal wounds, which ranged from 20–30%⁵. This discrepancy may reflect advancements in perioperative antibiotics, minimally invasive drainage techniques, or stricter adherence to aseptic protocols in contemporary practice⁶. Nevertheless, the persistence of an 18% SSI rate in PC underscores the inherent risks of immediate suturing in abscess settings, where polymicrobial flora and residual contamination may challenge primary healing.

Despite its advantage in reducing SSIs, DC was associated with prolonged hospitalization (5.8 vs. 3.2 days, $*p<0.001$) and extended healing times (14.5 vs. 10.2 days, $*p=0.01$). These findings highlight a clinical dilemma: while DC prioritizes infection control, it imposes greater healthcare resource utilization and delays return to daily activities. The longer hospital stay in the DC group likely reflects the need for daily wound care, monitoring for delayed complications, and patient reliance on inpatient pain management. This aligns with Tsang et al⁸ who observed similar trade-offs in appendectomy patients, where delayed closure increased length of stay but reduced readmission rates. Economically, the additional hospitalization days for DC could offset cost savings from preventing SSIs, warranting future cost-effectiveness analyses to guide institutional protocols.

Subgroup analysis revealed striking disparities in diabetic patients, with SSI rates of 30% in PC versus 12% in DC ($p=0.04$). This underscores the vulnerability of diabetic patients to infections due to impaired immune responses and microvascular dysfunction⁹. For this population, DC appears clinically prudent, as the risk-to-benefit ratio favors infection prevention over expedited recovery. These results advocate for personalized wound management strategies, where patient comorbidities—particularly diabetes—dictate closure techniques. Such tailored approaches could optimize outcomes in high-risk subgroups while reserving PC for healthier patients with lower infection susceptibility.

Paradoxically, despite higher SSI rates and comparable pain scores (not reported here), patient satisfaction was significantly higher in the PC group. This likely reflects the psychological and physical burdens of prolonged wound care, as delayed closure necessitates frequent dressing changes, restricted mobility, and visible wound management—factors that diminish quality of life during recovery. Prior studies have similarly noted that patient satisfaction correlates more strongly with convenience and rapid return to normalcy than with clinical metrics like SSI rates¹¹. This dichotomy emphasizes the need for shared decision-making, where clinicians transparently discuss trade-offs between infection risks and recovery burdens, enabling patients to prioritize outcomes aligned with their values.

The study's implications are twofold. First, DC should remain the standard for high-risk populations, including diabetics or immunocompromised individuals, where infection prevention is paramount. Second, PC may be judiciously offered to low-risk patients who value shorter recovery times, provided they accept the modestly elevated SSI risk. However, this strategy demands rigorous postoperative monitoring to detect early SSI signs, ensuring timely intervention. Institutions may also consider outpatient wound care protocols for DC patients to reduce hospitalization durations without compromising safety.

Limitations and Future Directions

This trial has several limitations. First, its single-center design may limit generalizability, as outcomes could vary with institutional protocols or surgeon expertise. Second, the sample size, though adequate for primary endpoints, may underpowered subgroup analyses, such as the diabetic cohort. Third, follow-up was limited to 30 days, potentially missing late complications like incisional hernias or recurrent abscesses. Future multicenter studies with extended follow-up periods are needed to validate these findings and assess long-term outcomes. Additionally, cost-effectiveness analyses comparing total healthcare expenditures (e.g., hospitalization, readmissions, wound care) between PC and DC could inform policy decisions. Lastly, exploring novel closure techniques—such as negative-pressure wound therapy or antimicrobial sutures—may further

optimize the balance between infection prevention and recovery efficiency.

Conclusion

This RCT elucidates the nuanced trade-offs between PC and DC in appendicular abscess management. While DC reduces SSIs, it prolongs recovery, whereas PC enhances patient satisfaction at the expense of higher infection rates. Tailoring strategies to individual risk profiles, particularly in diabetics, may optimize outcomes. These findings advocate for a patient-centered approach, integrating clinical evidence with personal preferences to guide postoperative care.

References

1. Bhangu A, Søreide K, Di Saverio S, Assarsson JH, Drake FT. Acute appendicitis: modern understanding of pathogenesis, diagnosis, and management. *Lancet*. 2015;386(10000):1278-1287. doi:10.1016/S0140-6736(15)00275-5.
2. Andersson RE. The natural history and traditional management of appendicitis revisited. *World J Surg*. 2007;31(1):86-92. doi:10.1007/s00268-006-0436-3.
3. Anthony T, Murray BW, Sum-Ping JT, et al. Evaluating the risk of nonclosure of fascia in emergent abdominal surgery. *J Am Coll Surg*. 2011;212(4):476-483. doi:10.1016/j.jamcollsurg.2010.12.036.
4. CODA Collaborative, Flum DR, Davidson GH, et al. A Randomized Trial Comparing Antibiotics with Appendectomy for Appendicitis. *N Engl J Med*. 2020;383(20):1907-1919. doi:10.1056/NEJMoa2014320.
5. Glickman LT, Gheorghe A, Hirst J, et al. Primary versus delayed closure of contaminated abdominal wounds: a meta-analysis of randomized controlled trials. *Ann Surg*. 2011;254(4):581-586. doi:10.1097/SLA.0b013e3182300fb6.
6. Sartelli M, Chichom-Mefire A, Labricciosa FM, et al. The management of intra-abdominal infections from a global perspective: 2017 WSES guidelines for management of intra-abdominal infections. *World J Emerg Surg*. 2018;13:9. doi:10.1186/s13017-018-0167-4.
7. Simillis C, Symeonides P, Shorthouse AJ, Tekkis PP. A meta-analysis comparing conservative treatment versus acute appendectomy for complicated appendicitis (abscess or phlegmon). *Br J Surg*. 2010;97(1):126-139. doi:10.1002/bjs.6924.

8. Tsang B, Tiwari T, Ross D, et al. Primary closure versus delayed closure for complicated appendicitis: a retrospective cohort study. *Ann Surg.* 2016;264(1):135-140. doi:10.1097/SLA.0000000000001377.
9. Umpierrez GE, Isaacs SD, Bazargan N, et al. Hyperglycemia: an independent marker of in-hospital mortality in patients with undiagnosed diabetes. *J ClinEndocrinolMetab.* 2012;87(3):978-982.
10. Wilhelmi BJ, Snyder N, Colquhoun T, Hadjipavlou A, Phillips LG. Avoidable complications of dirty wounds: debridement versus primary closure. *PlastReconstr Surg.* 1999;104(3):702-707. doi:10.1097/00006534-199909030-00015.
11. Sacks GD, Lawson EH, Dawes AJ, et al. Patient satisfaction with surgical care: a systematic review. *Am J Med Qual.* 2014;30(5):493-506.
12. U.S. Centers for Disease Control and Prevention (CDC). Surgical Site Infection (SSI) Event. Published 2017. Accessed July 1, 2023. <https://www.cdc.gov/nhsn/pdfs/pscmanual/9pscscscurrent.pdf>.

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