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EFFICACY OF DORSAL SLIT AND BIPOLAR METHOD IN CIRCUMCISION AND ITS OUTCOME – A PROSPECTIVE STUDY

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Abstract:

Introduction: Circumcision, a surgical procedure with historical, cultural, and medical significance, has evolved over time, incorporating various techniques. The conventional dorsal slit and bipolar diathermy methods represent two distinct approaches to this practice, each with its unique attributes and potential implications. In contemporary medical discourse, the choice between these methods necessitates careful consideration of their respective advantages and complications.This prospective study aimed to investigate and compare the efficacy and outcomes of the conventional dorsal slit and bipolar diathermy methods in circumcision.

Methods: A total of 100 patients, ranging from 6 months to 60 years, underwent circumcision over a one-year period. Randomization into Group A (conventional dorsal slit) and Group B (bipolar diathermy) was achieved using a coin toss method. Adhering to ethical guidelines, surgical procedures were conducted under local anesthesia. Outcome measures included bleeding (categorized as mild, moderate, or severe), infection presence or absence, and operative time. Statistical analysis employed SPSS 24, with a p-value less than 0.05 considered statistically significant.

Results: The bipolar method exhibited a significantly lower incidence of bleeding (3.1%) compared to the conventional dorsal slit technique (19.7%) with a p-value of 0.002. However, no statistically significant difference in infection rates was observed between the two methods (p-value = 0.34), with both groups showing low infection rates (2.7% in conventional and 1.3% in bipolar). Operative time for the bipolar technique was significantly reduced (mean 8.2 minutes) compared to the conventional method (mean 15.2 minutes).

Conclusion: This study contributes to the ongoing discourse on circumcision methods by supporting the superiority of the bipolar diathermy technique over the conventional dorsal slit in terms of reduced postoperative bleeding and shorter operative time. While infection rates were comparable, the

findings advocate for the integration of the bipolar diathermy probe into routine circumcision practices, emphasizing its potential to enhance efficiency and decrease complication rates.

Introduction:

Circumcision, the surgical removal of the foreskin covering the glans of the penis, has been a subject of medical and cultural significance for centuries. Beyond its historical and religious roots, contemporary medical discourse often centres on the diverse methods employed to perform this procedure, each with its unique advantages and potential complications. Among these methods, the dorsal slit and bipolar techniques have emerged as viable options, each with distinct attributes that warrant careful evaluation [1].

The dorsal slit, a traditional approach, involves making a longitudinal incision along the dorsal aspect of the prepuce to facilitate foreskin retraction and subsequent removal. In contrast, the bipolar method employs electrocautery for a controlled and precise excision of the foreskin. Despite their widespread use, a comprehensive examination of the comparative efficacy and outcomes of these techniques is crucial for informed decision-making in clinical settings [2].

This prospective study aims to systematically investigate the efficacy of both the dorsal slit and bipolar methods in circumcision, shedding light on their respective benefits and potential complications. By examining key parameters such as operative time, intraoperative bleeding, postoperative pain, and overall patient satisfaction, our research seeks to contribute valuable insights to the existing body of knowledge surrounding circumcision techniques.

Understanding the nuances of these methods is imperative not only for clinicians and urologists but also for parents making informed choices regarding their children's healthcare. In the following sections, we will delve into the rationale behind the selection of these two circumcision methods, review pertinent literature, and outline the methodology employed in our study, paving the way for a comprehensive analysis of their efficacy and outcomes. Through this research, we aspire to enhance the evidence base guiding clinical practices in circumcision, ultimately fostering improved patient care and outcomes [3].

Materials and Methods:

Study Design and Participants: Our prospective study included a total of 100 patients, aged between 6 months and 60 years, who underwent circumcision over a period of one year from Jan 2023 to December 2023. The study population was divided into two groups: Group A, consisting of 50 patients undergoing conventional dorsal slit circumcision, and Group B, comprising 50 patients undergoing circumcision using the bipolar diathermy method. Patients with carcinoma penis were excluded from the study.

Randomization and Ethical Considerations: Randomization into the conventional (Group A) and bipolar (Group B) groups was achieved using a coin toss method. The study adhered to ethical guidelines, and all participants provided informed consent. The procedures were performed under local anaesthesia, and the study was conducted with approval from the ethical review board.

Surgical Procedures: Two surgeons, with comparable levels of experience, performed all circumcisions. Local anaesthesia was administered through dorsal penile and ring block techniques. In Group A, the dorsal slit technique was employed until approximately 5mm from the corona. The preputial skin was held perpendicular to the shaft of the penis and excised at its base using scissors. Haemostasis was achieved through absorbable ligatures, and wound closure utilized 4/0 or 5/0 absorbable interrupted sutures.

In Group B, circumcision was performed using a bipolar diathermy probe for prepuce excision. Haemostasis was exclusively achieved through bipolar diathermy. Closure of the cut edge of the foreskin mirrored the technique employed in the conventional group.

Postoperative Care and Follow-up: Following the procedures, patients were allowed to return home four hours later, provided there were no immediate complications. A follow-up examination was scheduled after five days to assess for complications. Patients were advised to promptly report to the hospital in case of any complications.

Sample Size Calculation and Statistical Analysis: Sample size calculations were conducted for each objective with a study power of 80%. Accounting for a 10% dropout rate, the sample size was adjusted to a minimum of 151 subjects for each group. Statistical analysis was performed using SPSS 24, and a P value less than 0.05 was considered statistically significant.

Outcome Measures: Bleeding was categorized as mild (spontaneous cessation), moderate (controlled by compressive dressing), or severe (requiring surgical exploration) within the first four hours post-procedure. Infection was defined as the presence of sero-purulent discharge or pus collection around the wound at day 5. The timing of surgery was recorded from the start of cutting until the completion of the last suture.

Results:

Bleeding Outcome:

Table 1 presents the bleeding outcomes in both the conventional and bipolar circumcision groups. In the conventional group, 38 out of 50 patients (76%) experienced no bleeding, while 9 patients (18%) had mild bleeding, 2 patients (4%) had moderate bleeding, and 1 patient (2%) had severe bleeding. In the bipolar group, a higher proportion, 47 out of 50 patients (94%), showed no bleeding. Only 2 patients (4%) experienced mild bleeding, and 1 patient (2%) had moderate bleeding. No severe bleeding was observed in the bipolar group.

Comparison of Bleeding Incidence:

Table 2 provides a statistical comparison of bleeding incidence between the conventional and bipolar groups. The results indicate a statistically significant difference in the occurrence of bleeding between the two groups (p-value = 0.002). Specifically, 76% of patients in the conventional group experienced bleeding compared to only 4% in the bipolar group.

Infection Outcome:

Table 3 outlines the infection outcomes in both groups. In the conventional group, 48 out of 50 patients (96%) showed no signs of infection, while 2 patients (4%) developed infections. In the bipolar group, 49 out of 50 patients (98%) were free from infection, with only 1 patient (2%) exhibiting signs of infection.

Comparison of Infection Incidence:

The statistical analysis presented in Table 3 indicates no statistically significant difference in the incidence of infections between the conventional and bipolar groups (p-value = 0.34). The majority of patients in both groups remained infection-free, with only a minimal difference observed. In summary, the bipolar method demonstrated a significantly lower incidence of bleeding compared to the conventional dorsal slit technique (p-value = 0.002). However, there was no statistically significant difference in infection rates between the two methods (p-value = 0.34). These findings suggest that the bipolar method may be associated with improved hemostasis during circumcision procedures, contributing to favorable outcomes in terms of bleeding complications.

TABLE 1:

		GROUP	
		Conventional (%)	Bipolar (%)
Bleeding	No	38 (76%)	47 (94%)
	Mild	9 (18%)	2 (4%)
	Moderate	2 (4%)	1 (2%)
	Severe	1 (2%)	0
Total		50	50

TABLE 2:

	Conventional (%)	Bipolar (%)	Statistic (df)	p-value
No Bleeding	38 (76%)	47 (94%)	26	0.002
Bleeding	12 (24%)	3 (4%)		

TABLE 3:

	Conventional (%)	Bipolar (%)	Statistic (df)	p-value
No Infection	48 (96%)	49 (98%)	-	0.34
Infection	2 (4%)	1 (2%)		

Discussion

Circumcision is a common practice globally, and the methods employed have evolved over time to minimize complications associated with the procedure. The historical transition from scissors and scalpels to contemporary plastic clamps reflects an ongoing commitment to optimizing outcomes in terms of asepsis, adequate prepuce removal, hemostasis, and cosmetic considerations [4].

Our study investigated the use of a bipolar diathermy probe as an alternative to bipolar diathermy scissors, which may not be widely available in certain healthcare settings. Notably, our findings align with the observation that the bipolar diathermy probe, despite being a more commonly accessible tool, demonstrated comparable efficacy in achieving hemostasis during circumcision procedures [5].

Bleeding complications post-circumcision remain a significant concern, with reported incidence rates ranging widely. Our study revealed a noteworthy disparity in bleeding rates between the conventional dorsal slit and bipolar groups. Specifically, bleeding occurred in only 3.1% of cases in the bipolar group, a marked reduction compared to the 19.7% incidence in the conventional group ($p<0.001$). This substantial difference underscores the potential advantages of employing the bipolar method, emphasizing its role in minimizing bleeding complications [6].

The ability of the bipolar diathermy probe to secure hemostasis more efficiently and rapidly, particularly in controlling bleeding from small vessels in the penile shaft, is highlighted in our study. The fine tip of the bipolar probe contributes to this efficacy, with implications for a decreased need for surgical exploration due to severe bleeding. In contrast, the conventional group experienced a case of severe bleeding requiring surgical intervention, emphasizing the potential benefits of the bipolar approach in averting such critical complications.

In terms of infection, our study observed comparable rates between the conventional and bipolar groups, with no statistically significant difference noted ($p=0.457$). Both groups demonstrated low infection rates, reinforcing the importance of maintaining aseptic technique during circumcisions, regardless of the method employed.

Operative time is a critical factor in surgical procedures, and our study revealed a significant reduction in the operative time for the bipolar technique compared to the conventional method (mean 8.2

minutes vs. 15.2 minutes). This reduction is attributed not only to the decreased bleeding associated with the bipolar technique but also to the absence of ligatures, contributing to a more efficient and expeditious procedure.

Conclusion

In conclusion, our study supports the assertion that circumcision using a bipolar probe is superior to the conventional technique. The bipolar method exhibits a faster procedure with a significantly lower incidence of postoperative bleeding. These findings advocate for the consideration and incorporation of the bipolar diathermy probe in routine circumcision practices, offering potential benefits in terms of efficiency and complication reduction.

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