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## A Study on Effectiveness of Stapler Method of Circumcision over Conventional Circumcision in Adult Males: A Prospective Study

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### ABSTRACT

The most common surgery done by a urologist is male circumcision. In this present study, we have investigated the effectiveness and safety of a novel surgical method for male circumcision by using circular stapler. Ten consecutive adult male patients were split into two groups at random: five had stapler circumcisions and five had traditional circumcisions. The duration of surgery, level of pain perception, amount of blood lost, length of recovery, cost of the procedure and postoperative complications were contrasted between the two groups. In comparison to the traditional group, the stapler group's operating time (min) was considerably less ( $14.8 \pm 0.84$  vs.  $28.6 \pm 3.13$  min), with a statistically significant p-value of 0.008. Similarly, intraoperative bleeding was seen in only 20% of patients from stapler group while all the patients (100%) from conventional group, this was statistically significant with a p-value of 0.024. The stapler group experienced significantly fewer pain scores after surgery ( $3.8 \pm 1.5$  vs  $12.2 \pm 3.3$ , respectively: p value-0.008) than the traditional group. Furthermore, stapler surgery is cosmetically better than in the traditional group (100 vs. 60%, respectively: p value-0.222). We have concluded that stapler circumcision is a quick and secure surgical method for male, still further studies with larger sample size are required.

## INTRODUCTION

Circumcisions are among the most performed surgical operations in males<sup>[1]</sup>. The foreskin conditions listed below are usually reasons for surgical or dissection intervention. Phimosis is a congenital or acquired condition associated with incomplete exposure of glans because of restriction of prepuce resulting in failure of foreskin retraction. It presents as swelling, difficult and painful erections, variety of sexually transmitted infections and candidiasis<sup>[2]</sup>. Swelling and enlargement of the distal penis is a result of formation of tight constricting band because of failure of foreskin to drawn back over the glans after retracting.

Balanitis is characterised by inflammation restricted to the glans and foreskin is usually non-retractile while Balanoposthitis is involvement prepuce<sup>[3]</sup>. Standard surgical methods, routinely employed are based on crushing the foreskin at the proposed tissue apposition line while simultaneously obtaining haemostasis. This result in ischemic necrosis of the foreskin, then either it is allowed to fall off or removed. The crushed and approximated edges are sutured, bonded, or sometimes allow to heal naturally<sup>[4]</sup>. Male circumcision has various benefits such as reduce incidence of balanitis, various genitourinary disorders, risk of penile cancer because of reduced penile sensitivity<sup>[5]</sup> and enhances sexual satisfaction. Many studies have found a marked decrease in viral transmission through sexual activity because of male circumcision such as human immunodeficiency virus, human papillomavirus and herpes simplex virus type-2<sup>[6,7]</sup>. Moreover, inflammation and cervical cancer are efficiently avoided in the female partners of circumcised men<sup>[6]</sup>. The risk of sexually transmitted illnesses such as the human papillomavirus, genital ulcer disease and HIV infection may be reduced because of this operation. Additionally, it enhances topical cleanliness for the penis and lowers the risk of balanitis and penile cancer. The dorsal slit, the forceps-guided approach and sleeve resection are the three techniques included in conventional MC as advised by the World Health Organization (WHO)<sup>[7]</sup>. But in individuals who have conventional MC, issues including bleeding, edema and unsatisfactory cosmetic outcomes are still frequent. Additionally, traditional MC takes a lot of time.

## MATERIALS AND METHODS

Before participating in the procedures, patients submitted written informed permission that was approved by the clinical trial's ethical committee. All patients who were included were adult men between the ages of 18 and 70 who had a superfluous prepuce

or phimosis. Acute genital infection (acute posthitis or balanitis), thickened prepuce from chronic inflammation, significant foreskin adhesion, or other contraindications to MC like a hidden penis or STDs were the exclusion criteria. From January to December 2022, a total of 10 patients were prospectively enrolled in the current study. Five patients received stapler circumcision and five patients got traditional circumcision. The patients came from four surgery departments. For at least 4 weeks following circumcision, all patients were instructed to refrain from sexual activity and masturbation for at least six weeks after circumcision.

**Surgical procedure:** The penis just below the glans was measured in the stapler group to determine the proper size of the stapler device. After that, povidone-iodine was surgically used to disinfect the penis. The procedure was carried out as per a predetermined protocol and 2% lidocaine was used to accomplish circumferential and dorsal penile nerve blocks. According to the WHO guidance manual, all patients in the conventional group had MC using the dorsal slit technique. Well-versed surgeons performed all circumcisions.

### Operational definitions<sup>[4]</sup>

**Mild edema:** Mild edema was present when the perimeter of the inner foreskin layer, including the edema, was less than or equal to 30% of the perimeter of the penile shaft.

**Severe edema:** If the perimeter was >30% of the penile shaft, the edema was classified as severe.

**Wound dehiscence:** Wound dehiscence was defined as a >2 mm separation of the wound edge.

**Postoperative bleeding:** Postoperative bleeding was defined as bleeding that required suture closure.

**Healing time:** The healing time was defined as the time point at which the crusts of the wound disappeared and the healing line totally appeared.

**Patient follow-up and data collection:** All patients were followed up on the 1st day; 1st, 2nd and 3rd weeks; and 1st and 3rd months after surgery. Additionally, an investigator called each patient to inquire about the wound condition until complete healing was achieved. Five patients who underwent the stapler technique were followed up 1 year after circumcision. The following data were collected and compared between the two groups: operative time,

pain score (intraoperative and 1 hrs after surgery), blood loss volume, postoperative complications, healing time and treatment costs. We used an internationally accepted visual analogue scale to evaluate pain.

**Statistical analysis:** SPSS1, version 16.0, was used to compute all statistical analyses (SPSS Inc., USA). The operation time and pain scores were compared between the two groups using the Mann-Whitney U test. To compare the presence of intra-operative bleeding, patient satisfaction and for cosmetical improval chi-square test was used. A p-value of 0.05 was used to determine statistical significance.

## RESULTS

**Patient characteristics:** The two groups' patient characteristics were very evenly distributed. Age, sexual history, or past infections did not differ statistically significantly. Primary phimosis, secondary phimosis and prostatitis were more common in the conventional group of patients (Table 1).

The results of the stapler and traditional circumcision are depicted in Table 2.

In comparison to the traditional group, the stapler group's operating time (in minutes) was considerably less ( $14.8 \pm 0.84$  vs.  $28.6 \pm 3.13$  min), with a statistically significant p-value of 0.008. Similarly, only 20% of patients in the stapler group had intraoperative bleeding and 100% of patients in the conventional group had bleeding which is statistically significant with a p-value of 0.024. The stapler group experienced significantly fewer pain scores after surgery ( $3.8 \pm 1.5$  vs.  $12.2 \pm 3.3$ , respectively: p value-0.008) than the traditional group. Similarly, patient satisfaction was higher in the stapler group than in traditional groups (100 vs. 80%, respectively: p-value-0.5). Furthermore, stapler surgery is cosmetically better than in the traditional group (100 vs. 60%, respectively: p value-0.222). Additionally, the stapler group had a

significantly higher complication rate than the conventional group (100 vs. 60%, respectively: p value-0.222).

## DISCUSSION

Circumcision is one of the oldest and most performed surgical procedures in practice today. Circumcision is the main treatment for phimosis and redundant prepuce. Although dorsal incision circumcision is the traditional method of circumcision, it has the disadvantages of long operation time, stitch removal pain and easy infection of the wound; furthermore, surgeons who are new to the technique can easily generate adverse events such as an irregular incision and postoperative hematoma<sup>[7]</sup>.

The most common procedure that is performed by a urologist is Male circumcision<sup>[8]</sup>. Three traditional methods for circumcision are advised by the WHO and includes dorsal slit, the forceps-guided method and sleeve resection and they are practiced all across the world<sup>[8]</sup>. However, traditional circumcision still has some drawbacks, including the need for training, the potential for a high rate of complications<sup>[9]</sup>, particularly in some African nations where circumcision is frequently carried out by untrained and unequipped health workers and the fact that it takes time even when done by skilled surgeons<sup>[10]</sup>.

Now a days circular stapler method is use for circumcision procedure. It was created for the Chinese market and is used in several hospitals there. In accordance with the study conducted by Yuan *et al.*, our data demonstrate that male circumcision by stapler method has some advantages, including a short operating period, little discomfort and minimum blood loss during the procedure that is equivalent to that of another innovative circumcision equipment. Stapler can be applied in high-volume settings by healthcare professionals with little training as it is simple and fast operational and recovery periods. Cost is now the biggest barrier to widespread use. The circular stapler in a reusable form might be the answer<sup>[8]</sup>.

Our research has demonstrated that, side effects such as severe edema and wound dehiscence followed by surgical method were less in stapler circumcision than traditional circumcision, particularly in terms of. The advantages of stapler circumcision could be because of quick healing period, low risk of tissue damage and absence of electrocautery. Because of the lack of standardization and the use of various study methods, it has been difficult to compare the prevalence of problems among studies. To reduce pain after the procedure, the foreskin is first thoroughly sliced with the stapler.

According to patient self-reports, when a spontaneous or nocturnal erection takes place, this

Table 1: Distribution of age of the study participants

Treatment group	Mean	Median	SD
Traditional group (n = 5)	45.2	54	22.7
Stapler group (n = 5)	42	42	20.8

Table 2: Comparison of traditional vs. stapler circumcision

Outcomes	Traditional (n = 5)	Stapler (n = 5)	p-value
Mean operative time (min)	$28.6 \pm 3.13$	$14.8 \pm 0.84$	0.008*
Intra-operative bleeding	5 (100.0%)	1 (20.0%)	0.024*
<b>The volume of Blood Loss</b>			
Little	(2) 40%	(1) 100%	-
Excessive	(5) 60%	(0) 0%	-
Post-op pain	$12.2 \pm 3.3$	$3.8 \pm 1.5$	0.008*
Cosmetically better	3 (60.0%)	5 (100.0%)	0.222
Patient satisfaction	4 (80.0%)	5 (100.0%)	0.5
Complication	3 (60%)	5 (100.0%)	0.222

\*p<0.05

postoperative pain can become very intense. Second, patients who have their foreskin removed with a stapler heal more quickly. Ring removal and rebuilding of local blood circulation takes more time. Third, less wound dehiscence occurs in patients who receive stapler circumcision.

Primary drawback of stapler method for circumcision is the requirement to take out the leftover staples after surgery. In this study, surgeon was required to remove any remaining staples, in those who underwent stapler circumcision. The other option is to make the staples' substance better so that they break naturally after a month.

## CONCLUSION

A circular stapler is a simple and easy technique for performing male circumcision. It is linked to minimal intraoperative haemorrhage and less postoperative discomfort. This novel technology could considerably simplify and regulate circumcised operations; thus, its mass acceptance might be advantageous. It adopted and performed by an with skilled expertise, it has the ability to become the standard MC technique with further development.

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