

# Bipolar Circumcision: A New Technique for an Old Procedure with Quantified Cosmetic Outcome

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## Abstract

**Background:** Circumcision using bipolar diathermy is well established and used widely. It seems to be superior in terms of post operative complications. The cosmetic outcome of the procedure has never been quantitatively described though. **Aims:** To describe a modification to performing circumcision with bipolar that involves applying four clamps to the foreskin as it is being amputated with the bipolar so that a consistent length of the mucosal cuff can be obtained with a single almost bloodless cut. **Methods:** Prospective case series of all patients circumcised using the 4 clamps traction and bipolar cut technique. The cosmetic outcome was assessed in terms of the length of the mucosal cuff in absolute numbers and in proportion to the penile and glanular length. **Results:** Seventy four patients were recruited with a median age of 3.5 months. No complications were encountered. The average length of the penis was  $40 \pm 13$  mm and the glans  $12 \pm 3.6$  mm. The average length of the mucosal cuff was  $8.4 \pm 2.9$  mm, and the proportion to total penile length was  $21.1\% \pm 4.7\%$  and to glans length  $72\% \pm 24.1\%$ . **Conclusion:** The four clamp traction method with bipolar circumcision is safe and has a satisfactory cosmetic outcome.

**Keywords:** Bipolar, circumcision, quantified outcome

## INTRODUCTION

Circumcision is one of the oldest and most widely practiced procedures.<sup>[1]</sup> Numerous techniques exist with no consensus on which is best. The use of bipolar diathermy is well established and might result in less tissue damage, bleeding complications and reduced operative time.<sup>[2-4]</sup> The precise cosmetic result, however, has not been described. We here describe a new modification to the technique using regular bipolar forceps without resorting to blind crushing or cutting of the foreskin and present the cosmetic result in terms of the length of the mucosal cuff.

## METHODS

The technique used is briefly described and shown in Figures 1 and 2. The numbers in the methods section refers to the numbers in the figures. Initially, the foreskin is fully separated from the glans. The fraenum is taken down with bipolar (1). The mucosa is then held with two clamps: ventrally just below the lower end of the divided fraenum (2) and dorsally

just above the paraphimotic ring that results from retraction of the foreskin (3). The clamps are pulled up (4, 5) and a soft non crushing McIndoe forceps is then placed on the skin at the level of the edge of the corona, and the skin then is pulled back up above the glans and held tightly (6). Two additional clamps are placed on the external skin to maintain traction (7,8). Having the 4 clamps in position before cutting ensure tension is applied both on the inner and outer prepuce. Two clamps are applied on inner prepuce and two on outer. The foreskin is then divided just above the forceps with the bipolar forceps using a piecemeal movement and under direct vision (9, 10). We use the macro setting with a power of 12 on our machine (Valleylab) for the cutting part of the procedure. No additional trimming of mucosa was done. Any residual bleeding point is handled with bipolar on standard

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Received: 17-07-2020 Revised: 10-09-2020 Accepted: 19-09-2020 Available Online: 30-07-2021

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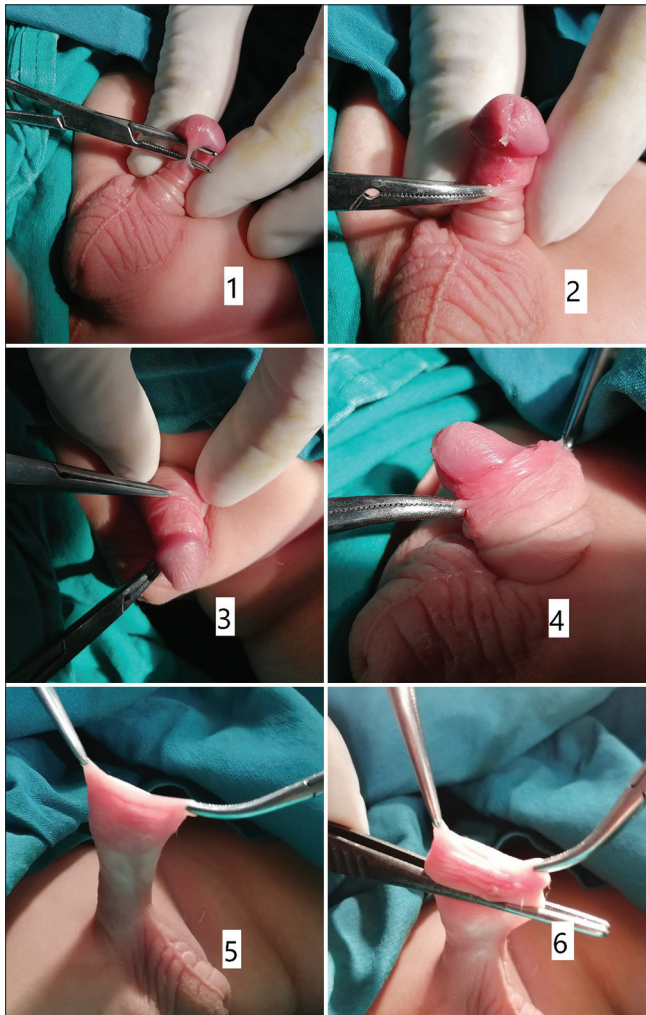
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10.4103/ajps.AJPS\_108\_20

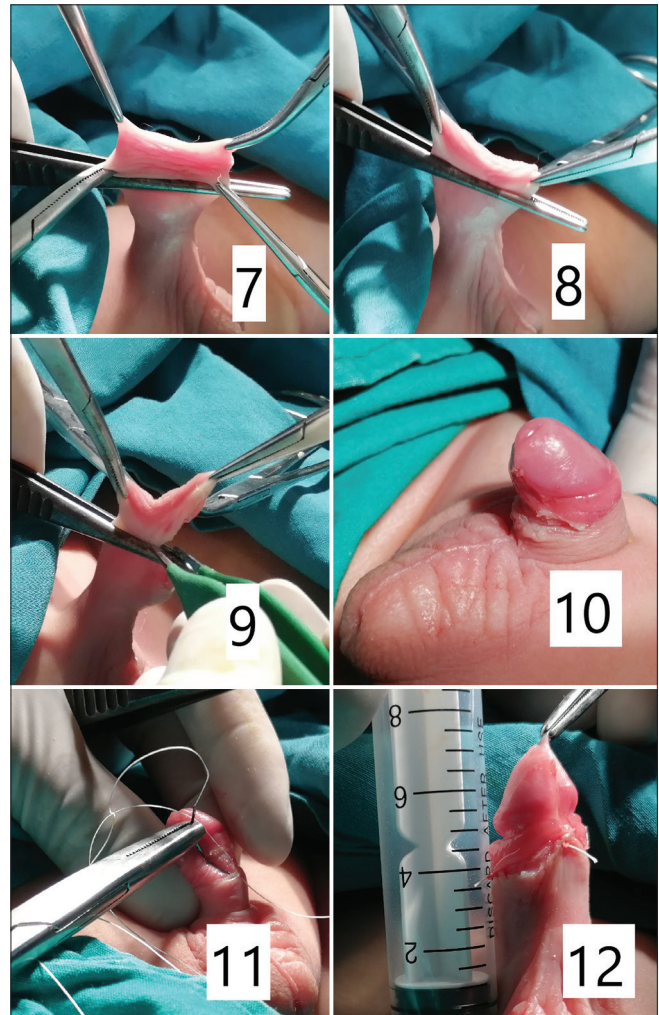
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**How to cite this article:** El-Mefleh N, Kaddah M, Ba'Ath ME. Bipolar circumcision: A new technique for an old procedure with quantified cosmetic outcome. Afr J Paediatr Surg 2021;18:187-9.



**Figure 1:** Technical steps of circumcision 1–6



**Figure 2:** Technical steps of circumcision 7–12

setting. The skin and mucosa are then re approximated (11) with four fine absorbable sutures (5 0 Vicryl Rapide). All consecutive boys who underwent circumcision using this technique between December 2018 and September 2019 were enrolled, and the data were collected prospectively, recording age, any complications, length of glans, penis and mucosal cuff following circumcision. The length was measured with penis held from the meatus using fine forceps without excessive stretching (12). The length was considered in absolute numbers (in mm) and as a percentage to the penile length. The data were presented as mean  $\pm$  SD or median as appropriate.

## RESULTS

Seventy-four patients were recruited. The median age was 3.5 months (quartiles 2–12). No complications were encountered. The average length of the penis was  $40 \pm 13$  mm and the glans  $12 \pm 3.6$  mm. The average length of the mucosal cuff was  $8.4 \pm 2.9$  mm, and the proportion to total penile length was  $21.1\% \pm 4.7\%$  and to glans length  $72\% \pm 24.1\%$ . The detailed results are presented in Table 1.

## DISCUSSION

Bipolar circumcision using either regular forceps or scissors is safe and effective.<sup>[3,4]</sup> As it does involve pulling up the prepuce and blind cutting, there is some risk of leaving behind a mucosal cuff that is too long. Excessively long mucosal cuff might be associated with premature ejaculation in adults,<sup>[5]</sup> although the evidence seems to be conflicting.<sup>[6]</sup> Circumcised men have been shown to have longer intravaginal ejaculatory latency time than uncircumcised men in general,<sup>[7]</sup> which might support the link between premature ejaculation and a long mucosal cuff. Leaving a long mucosal cuff might also increase the risk of acquired phimosis and the need for redo circumcision. The length of the residual mucosal cuff might have cosmetic implications although this is difficult to measure, especially given the discrepancy between surgeon's and parent's perception.<sup>[8]</sup> The optimal length of the residual mucosal cuff is therefore hard to define objectively, although many institutions seem to take 5 mm as an acceptable figure. It will of course vary with age and penile length. One way to standardise the length of the residual mucosal cuff is to

**Table 1: Cosmetic results**

	Length of the penis	Length of the glans	Length of remaining mucosa	Length of the shaft skin	Percentage of mucosal cuff to total length	Percentage of mucosal cuff to glans	Percentage of shaft skin to total penile length	Percentage glans to total length
Mean	40.5	1.2	0.84	1.99	21.1	72.9	48.4	30.4
SD	13.5	0.36	0.29	0.85	4.7	24.1	6.3	5.2

SD: Standard deviation

**Figure 3:** Long-term follow-up pictures of patients circumcised using the technique described

measure it as a proportion of the length of the penis, which is the method we used.

Applying the clamps to the inner prepuce separately likely helps to reduce the length of the residual mucosal cuff and therefore avoid the need for additional trimming. This should result in shorter operative time and more likely to lead to a symmetrical cut. One cut only is done during the procedure so time is reduced and symmetry is ensured. The average length of the remaining mucosal cuff using our method is less than the glans length and therefore makes it quite unlikely that the child will develop acquired phimosis and need redo circumcision. We did not repeat the measurements long term; however, Figure 3 shows a collection of our patients with long-term follow-up pictures of the circumcised penis.

Penile measurements in infants are difficult to standardise. We simply pulled the penis up using blunt forceps holding the edge of the meatus until it was straight and then measured the length using a ruler or a graded syringe as in the picture. The bottom surface of the syringe is touching the skin next to the penis

as a point for starting the measurement of penile length. The exact amount of traction applied to the penis was not measured or standardised, but it could be argued that any amount of stretching applied to the penis will stretch all components and therefore the relative size of each will stay the same. In other words, while changing the amount of traction could change the absolute length measurement of either component, the percentage it represents will stay the same; hence, we chose to present our results in millimetres and percentages.

## CONCLUSION

Using the technique described, bipolar circumcision is safe. It could achieve acceptable cosmetic results in terms of mucosal cuff length without the need for additional trimming of mucosa following initial cut.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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