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Circumcisor: An Instrument for Circumcision

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Abstract

Introduction: **Circumcision is a common procedure in surgical practice. However, the operation sometimes brings about poor outcome when using conventional technique of "clamp and cut" with arterial forceps and metzenbaum scissors. The unsatisfactory look of asymmetrical cut of the right and left wing of prepuce and the difficult hemostasis that renders post-operative wound hematoma are the problems of this technique. To solve these problems, an instrument "Circumçisor" is invented.**

Materials and Methods: **Circumcisor is a medical device designed for circumcision in adult patients. The instrument consists of two parts, the stand and the splint. The stand is a cylindrical tube with expanded circular base. It has spiral grooves at its outer surface. The splint is also a cylindrical tube with spiral grooves at its inner surface that matches with the outside grooves of the stand. Below the upper end of the splint there are two circular grooves indicating the cutting line. The two parts are connected together before applying to the patient. Circumcisor was applied in 21 adult patients who underwent circumcision at 4 hospitals (10 cases at Kamphaengphet Hospital, 1 case at Lopburi cancer center, 5 cases at Rajthanee Hospital and 5 cases at Petcharat Hospital) during January 1, 2000 to April 30, 2005.**

Results: **The operative time ranged from 45 to 50 minutes. There was no complication in this study. The wound healed well with smooth and equal cutting line. Patients were satisfied with the cosmetic appearance.**

Conclusions: **Circumcisor is a new medical device for adult circumcision. It is easily applied. It provides good hemostatic control and give a satisfactory result.**

Circumcision is categorized as a minor urological surgery in some training centers. However, in "real" surgical practice, especially in a general hospital where there is no urologist, a general surgeon usually has to perform this procedure. The conventional steps of the operation[1-3] consists of dorsal slitting of the prepuce, followed by cutting off the right and left half of prepuce. Hemostatic control of bleeding points and suturing of the raw surface make this procedure a time consuming one. The difficult hemostasis at the cut surface can lead to post-operative wound hematoma[1,2,4]. The unequal cut between the right and left half of prepuce makes the appearance cosmetically unsatisfied. To solve these problems, a "circumcisor" is invented.

Materials and Methods

The instrument consists of two parts, the stand and the splint (Figure 1). The stand is a cylindrical tube, 32 mm. in diameter, with expanded circular base. At the outer surface of the tube there are spiral grooves running along its length. The splint is also a

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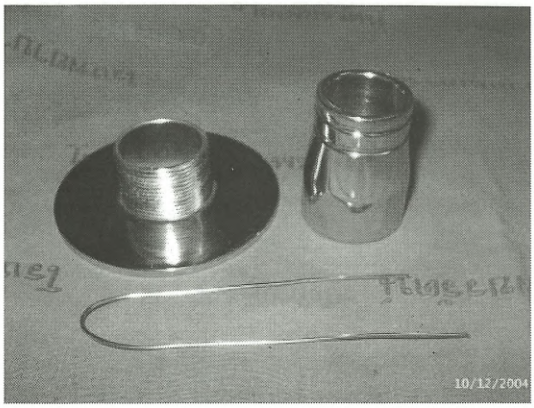

Fig. 1 The stand and the Splint

Fig. 2 The two parts are connected together

Fig. 3 A young man with phimosis

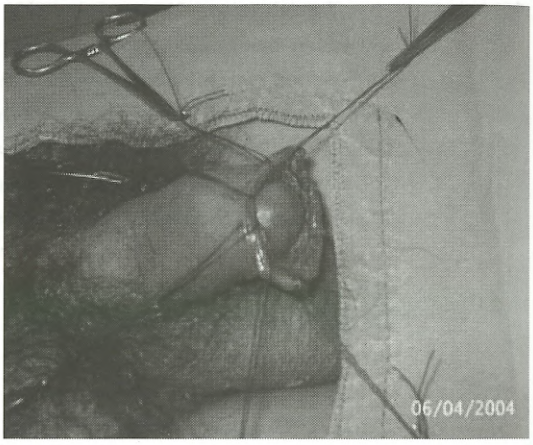

Fig. 4 The prepuce was dorsally slit and hung

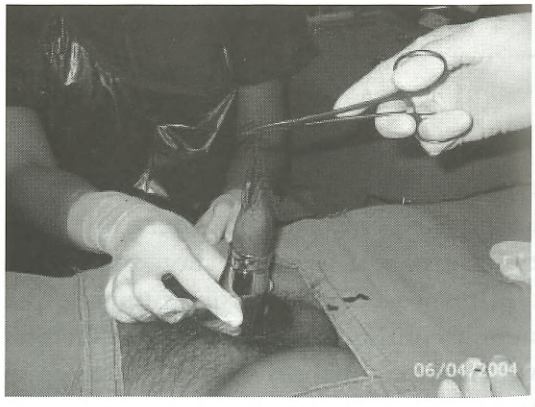

Fig. 5 The circumcisor was applied on the penis

cylindrical tube with spiral grooves in its inner surface that matches with the outer spiral grooves of the stand. At the upper end of the splint there are two circular grooves circled around to indicate the cutting line. To apply the circumcisor, the two parts are connected together (Figure 2). Screwing up or down the splint can adjust the height of the instrument from 45 to 70 mm. to match the length of the penis.

Between January 1, 2000 to April 30, 2005, a "circumcisor", an instrument for adult circumcision was designed and developed and had been applied in 21 adult patients undergoing circumcision at Kamphaengphet Hospital (10 cases), Lopburi Cancer Center (1 case), Rajthanee Hospital (5 cases) and Petcharat Hospital (5 cases).

After local infiltration with 20 ml of 1% xylocaine with adrenaline at the root of the penis[3,4], the prepuce was dorsally slit and hung with multiple sutures (Figure 3 & 4). The instrument was then applied on the penis (Figure 5). The height of the splint was adjusted and brought up to the level of the corona of glans penis (Figure 6). The prepuce was then retracted downward and stretched on the splint. After approximating the cutting line on the right and left wing of prepuce

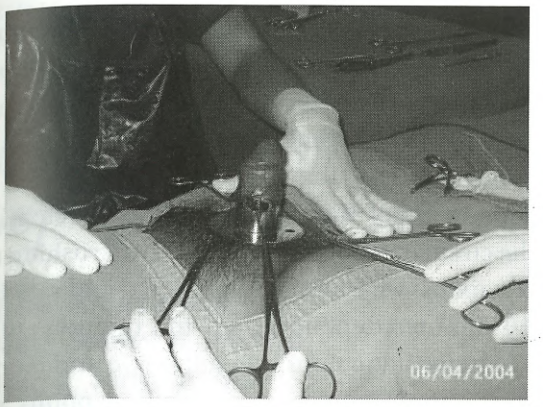

Fig. 6 The prepuce was retracted down and stretched on the splint

Fig. 7 A stainless wire loop was applied on the groove

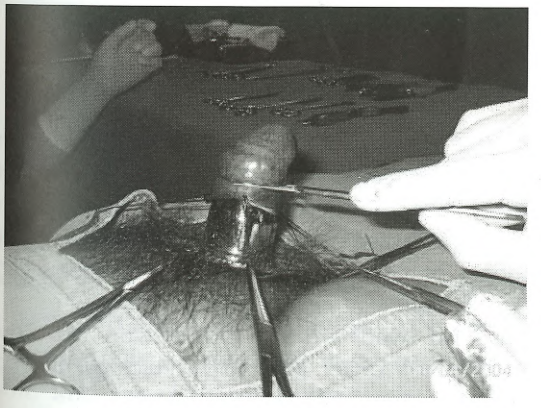

Fig. 8 The redundant prepuce was cut under the wire loop

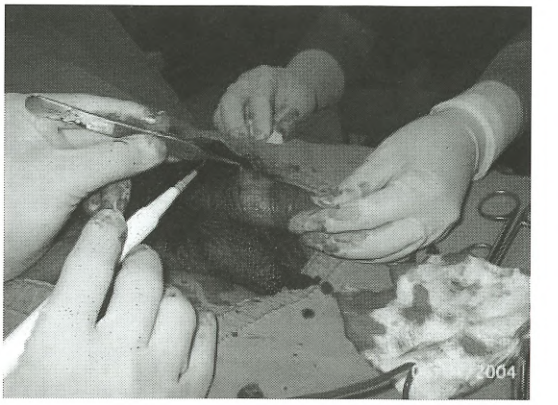

Fig. 9 The raw surface was peeled open and coagulated

Fig. 10 The skin and mucosal layer were sewn together

equally, a loop of stainless wire was then applied on the circular groove (Figure 7). To cut the prepuce closer to the corona, the loop was applied on the upper groove otherwise it was applied on the lower groove.

The prepuce was crushed for 5-10 minutes and then resected (Figure 8). The redundant part of the prepuce was then removed along with the instrument. The raw surface (skin and mucosal layer) was peeled open and bleeding points were controlled (Figure 9). After hemostasis was completed, the skin and mucosal layer were sewn together with 3/0 plain catgut (Figure 10).

Results

The instrument provided a smooth and symmetrical cut between right and left wing of prepuce and offered a good hemostatic control. The average operative time ranged from 45 to 50 minutes. No complication was observed in this study and the patients were satisfied with the cosmetic appearance. When the patients returned for follow up, the wound showed minimal edema (Figure 11) and healed well with smooth and equal cutting line (Figure 12).

Fig. 11 Second post-operative day with minimal wound edema

Fig. 12 Completely healed wound with smooth cutting line

Discussion

Circumcisor was designed by using a condom as a model. The unelastic property of the metal fixed the diameter of the stand to 32 mm. However, the height of the connected parts could extend from 45 mm to 70 mm, made it adaptable to varying length of penis. The expanded base helped stabilizing the penis in vertical position. The two circular grooves helped the surgeon to select a proper resected level.[1,2] A stainless wire loop, once applied tightly on the circular grooves, secured the prepuce while cutting. The smooth and accurate raw surface supported a good hemostatic control and good re-approximation.

Of all 21 cases that the instrument had been used, we did not encounter the problem where the penis was bigger than the diameter of the instrument. On the contrary, we found some cases where the penis was much smaller than the instrument. However, the elastic property of the prepuce helped stretch itself over the circular groove in all cases. The crushing time after a stainless wire loop was applied could vary from 5 to 10 minutes depending on the tightness of the loop. In hemostatic steps, when the skin and mucosal layer were peeled apart, the bleeding points were clearly seen and easily coagulated with cautery. When the patients returned for follow up, the wound showed minimal edema and healed well with smooth and equal cutting line.

Conclusions

Circumcisor is a new medical device. The instrument offers a better hemostatic control and more smooth and accurate cutting line. The absence of meticulous steps of the procedure renders this instrument easy to apply. It is suitable for a general practitioner or a less experienced surgeon.

However, to better study the effectiveness of this device, a larger number of patient sampling and accurate data collection and analysis should be further carried out.

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