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Research Article

**ASSESSMENT OF THE RESULTS OF SNODGRASS REPAIR  
IN HYOSPADIAS IN CONTRAST TO BRACKA'S STAGE II  
OPERATION**

Dr. Hafiza Ameema Saleem, Dr. Ume Roman, Dr. Huma Hussain Mughal

House officers, Sir Gang Ram hospital, Lahore

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**Abstract:**

**Objective:** Great progress has been made in hypospadias repair surgery. Proximal hypospadias remains the biggest challenge; despite many innovations and advances, the operation may fail. The purpose of this study was to evaluate the results of Snodgrass repair in hypospadias in our hand and at the same time identify cases not fit for this procedure.

**Place and Duration:** In the Surgical Units of Sir Gang Ram hospital, Lahore for one year duration from March 2019 to March 2020.

**Materials and methods:** 60 patients with proximal, coronal and sub-coronal hypospadias underwent surgical repair. Snodgrass repair was done in 30 cases (11 coronal and 19 sub-coronal), and Bracka II stage in 30 cases (26 proximal and 4 sub-crown). All cases in the Bracka stage II group whose chordee were corrected by preputial skin transplantation. The second stage of urethroplasty was carried out at least 6 months after the first stage.

**Results:** Thirty patients (50%) had normal meatal position, normal glanular anatomy, well defined coronal sulcus, normal cylindrical shaft and voided from the tip with very good cosmetic and functional results, ten patients (16.6%) developed meatal stenosis, nineteen patients (31.6%) urethrocutaneous fistula, eleven patients (18.3%) developed wound infection, four patients (6.6%) developed stricture. Meatal stenosis patients responded well to periodic dilation, fistula needs surgical intervention, wound infection responded well with daily dressing, stricture initially responded well with periodic dilatation later two patient's needs surgical intervention.

**Conclusion:** Snodgrass Repair offers optimal repair of distal and middle hypospadias with low complication rate and excellent cosmetic result. Progressive repair is a safe and reliable approach in selected patients, in which the urethral plaque cannot be combined with the repair, and therefore requires replacement.

**Keywords:** Snodgrass repair, Bracka repair, hypospadias, meatal stenosis

**Corresponding author:**

Dr Hafiza Ameema Saleem,

House officers, Sir Gang Ram hospital, Lahore

QR code



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## INTRODUCTION:

There has been great progress in surgery to correct hypospadias. Many techniques have evolved over the past 150 years to build a neouretra<sup>1</sup>. Hypospadias reported are 1/300 male births. Many methods of repairing hypospadias suggest that no method is generally satisfactory. Existing concepts of hypospadias pathophysiology that emphasize urethral plaque protection have brought hypospadias surgery closer to the functionally and cosmetically normally reconstructed penis goal over the past decade<sup>2</sup>. Snodgrass repair has become the preferred procedure for treating distal and proximal hypospadias due to the low rate of complications and excellent cosmetic results. Since encouraging results have been reported in many centers around the world, little local research has been conducted to evaluate this technique. In addition, long-term data on the tubularized incised-plate urethroplasty are still missing for final evaluation<sup>3</sup>. Therefore, comprehensive and rigorous Snodgrass repair analysis is needed to determine if this technique can withstand the passage of time. On the other hand, an alternative technique popularized by the British surgeon Bracka completely ignores the protection of the natural urethral plaque and replaces the entire urethral plaque with a hypoplastic pre-transplant transplant<sup>4-5</sup>. It has also gained popularity and several complications have been reported.

## PATIENTS AND METHODS:

This study was held in the Surgical Units Sir Gang Ram hospital, Lahore for one-year duration from March 2019 to March 2020. 60 patients with proximal, coronal and sub-coronal hypospadias underwent surgical repair. Snodgrass repair was done in 30 cases (11 coronal and 19 sub-coronal), and Bracka II stage in 30 cases (26 proximal and 4 sub-crown). The surgical method chosen for hypospadias was determined based on state of urethral plate, degree of chordee, shape of the glans, the size of phallus. Patients with mild and moderate chordee (30cases) were selected for extended Bracka staged repair and 30 patients those with mild chordee corrected by simple degloving for Snodgrass repair. Demographic data, hypospadias type and final results of hypospadias surgery were recorded. Diagnosis and treatment plan for parents; risk, complications and long-term follow-up plan. Urinary catheters were held for 7 to 10 days after surgery and evaluated 10 days after cathode

removal, calibration and serial re-testing to maintain its calibration. Patients were followed two weeks, three months and six months after surgery.

## Hypospadias repair report:

Snodgrass repair (30 cases): if the urethral plate is reasonable and of good quality, and the abdominal curvature can be corrected without cutting the urethral plate (protection of the urethral plate after releasing the duct). Repair of Snodgrass in one step (30 cases Fig. 1)

Bracka stage II (30 cases), a small, short and attached urethral plate can contribute to curvature and should be divided into segments. The first stage: the preparatory stage for the reconstruction of the urethra and the inclusion of the rope, the acorns are divided to form a groove covered with a premature transplant. Second stage control: foreskin transplant listing at least 6 months later.

## RESULTS:

Sixty patients, thirty patients operated on with the Snodgrass technique and thirty patients using the stage II of Bracka repair were included in the study. These patients were followed for six months and post-surgery complications were observed. The mean age after surgery was  $7.63 \pm 3.09$  years in the Bracka II group and  $6.36 \pm 3.05$  in the Snodgrass group aged 1 to 12 years. Regarding the location of the meatus, we divided patients into middle and distal groups (coronal and sub-crown). In the Bracka II group, 26 (86.6%) patients had mid-shaft and 4 (13.33%) patients had distal (sub-coronal) hypospadias. In the Snodgrass group, 11 (36.66%) patients had coronal and 19 (63.33%) had hypospadias on the distal axis. All the patients in Bracka stage II group whose chordee has been corrected with preputial graft while very minimal chordee in Snodgrass group which was corrected after the degloving of the skin upto the penoscrotal junction.

An interesting fact observed in this study was that 8 (26.6%) patients in the Bracka II group had more than one complication, and only 3 (10%) patients in the Snodgrass group had more than one complication. Complications were observed in 18 (60%) of 30 patients in the Bracka II group and 12 (40%) of 30 patients in the Snodgrass group (Table 1).

**Table 1: Complications in Bracka Stage II & Snodgrass Procedure**

Group of Pts		Complications		
		Yes	No	Total
Bracka II	Count	18	12	30
	% with in groups of Pt	60%	40%	100%
Snodgrass	Count	12	18	30
	% with in groups of Pt	40%	60%	100%
Total	Count	30%	30%	60%
	% with in groups of Pt	50%	50%	100%

Although complications were more common in the Bracka II group, they were not statistically significant because the P value was greater than 0.05. Gastric stenosis was detected in 6 patients (20%) in the Bracka II group and 4 patients (13.3%) in the Snodgrass group (Fig. 1). Twelve (40%) in the Bracka II group and 7 (23%) in the Snodgrass group developed a urethral fistula, while two of these patients had muscle stenosis in the Bracka II group, while none of the people in the Snodgrass group muscle narrowing. After surgery, 8 (26.7%) patients in the Bracka II group and 3 (10%) patients in the Snodgrass group had wound infection. Stenosis occurred in 3 (10%) patients in the Bracka II group and only 1 patient (3.3%) in the Snodgrass group.

While two fistulas were in the coronal area, one patient had a fistula in the primary area of the subcutaneous original hypospadiac meatus. Meatal stenosis was conservatively managed with routine dilatation of the meatal in both patients, and subjective complaints were treated in one patient, but one patient required meatoplasty.

### DISCUSSION:

The goal of hypospadias surgery is to provide a flat penis and to ensure normal release and sexual function during sexual intercourse. However, the long-term psychological consequences of cosmetically unsatisfactory repair justify the need for optimal repair that can provide a functionally and cosmetically normal result<sup>6-7</sup>. Our experience with both techniques has demonstrated the versatility of the urethroplasty as a longitudinal incision of the midline leading to the enlargement of the urethral plate, thus enabling the urethral plate to be assembled in Snodgrass repair. In the 2nd stage of Bracka, it was easy to sum up the already enlarged urethral plate<sup>8</sup>. During the procedure, a high percentage of complications occurred due to the different levels of experience of different surgeons<sup>9</sup>. In our study, simply trimming the penis skin in the Snodgrass group can improve the chorus in thirty patients, while the cornea has already been repaired in all patients in Bracka II stage. Recurrent penile cords in later life can be a potential complication<sup>10-13</sup>. In one study, all patients with late onset of penile chord had a mid-axis hypospadias during the first surgery. In our study, fistula developed in 7 (23%) patients with distal penile hypospadias and in 12 (40%) patients with hypospadias in the middle axis. 54 studies report fistulas ranging from 4 to 16% for distal penile and medial hypospadias, soft tissue management, age patients, hypospadias defect level, surgeon experience, foreskin, and foreskin reconstruction. Perhaps in our series a surgeon who has a large number of operations with varying interest and experience has contributed to this high fistula rate<sup>14</sup>. In our study, meatal stenosis developed in Snodgrass patients and 6 (20%) patients with the 2nd stage of Bracka repair. Other studies indicate

meatal stenosis between 2 and 20%. In this study, we could not find a case of suture sinus. Some studies have found that as much as 24%. For our patients, the reason for avoiding complications may be the use of the cut stitch technique to cover the skin of the penis with the chromium catgut 4/0. The reason for the decrease in detection of this complication in this study may be a relatively short observation period (six months). Dark skin can make complications less noticeable than in our patients<sup>15</sup>. Our study found urethral strictures. One (3.33%) in Snodgrass and three (10%) patients in Bracka phase II were repaired. This complication is a potential complication, but many reported studies have not been found. Snodgrass observed patients who had undergone this technique for a year after surgery, and assessed the urethra using urethral and uroflowmetry, and found that incision of the urethral plate did not lead to narrowing of the urethra. However, one study had an 8% stenosis rate, but this study used the Snodgrass procedure to treat failed hypospadias repair. In this study, stenosis occurred between the normal urethra and the neourethra. Although the parameters described for the assessment of cosmetic results are still discussed, there is growing concern about the psychological significance of the poor aesthetics of subcutaneous surgery. The orientation and location of the urethral opening has recently raised greater concern because dissatisfaction has prompted patients to seek corrective surgery. We managed to obtain vertically oriented limb cleft muscle in 50% of patients with Snodgrass repair and in 40% of patients in stage II Bracka repair. About 50% of parents (30) (N = 60) were satisfied with the aesthetic appearance of the repaired penis in patients without postoperative complications. 50% (30) of parents did not judge the

appearance of the penis as satisfactory. Reported outstanding Snodgrass repair results are good urethral vascularization, urethral uneven plate management, single suture line closure, low transplant-free complication, and good aesthetics. Several studies have shown outstanding results compared to other surgical techniques in the treatment of hypospadias repair Snodgrass. These studies showed that the rate of fistula formation and flap necrosis was significantly lower when using the Snodgrass technique compared to Bracka II repair. Snodgrass urethroplasty has been found to be more convenient and less demanding than most ongoing Bracian repairs by most surgeons.

### CONCLUSIONS:

This is very true in the old hypospadias surgery, saying, "There is more than one way to skin a cat." This proposed protocol and indeed any alternative protocol will not be attractive to everyone and they will be surgeons who have extensive experience in patch repair and are satisfied with the results. A highly experienced and technically qualified super specialist may think that he can fix almost all his cases with one-step procedures and very little use the Bracka approach. Snodgrass repair offers optimal repair of distal and middle hypospadiac defects with a low percentage of complications and an excellent cosmetic effect. Although progressive repair is not a safe and reliable approach in selected patients requiring replacement, urethral plate cannot be combined with repair. More research needs to be done to assess the benefits of these techniques not only in terms of complications, but also in functional and cosmetic results using parameters such as glanular configuration, urine flow, maximum and average urine flow and erection. The final result of the Stage II Snodgrass & Bracka technique can be assessed only when the patient reaches puberty.

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