COMPARISON OF MAGPI AND MATHIEU REPAIR IN DISTAL HYPOSPADIAS

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ABSTRACT

Objective: To compare the outcome of MAGPI and Mathieu Procedures in the treatment of distal penile hypospadias in children.

Material and Methods: This prospective comparative study was conducted in the Department of Paediatric surgery Lady Reading Hospital, Peshawar from Jan 2002 to Dec 2002. A total of 40 children with distal hypospadias without chordae were selected. They were divided into two groups. Group one consisted of 20 children with glandular, coronal and subcoronal hypospadias without a groove in the glans penis. For this group MAGPI procedure was performed. Group two consisted of 20 children with coronal and subcoronal hypospadias with a groove in the glans penis. This group was managed with Mathieu procedure. Results of the two procedures were compared. Age of these boys ranged from one to 10 years. 32 children had coronal and subcoronal hypospadias while 8 had glandular hypospadias.

Results: Functional and cosmetic results were good in Mathieu procedure but the fistula rate was more as compared to MAGPI procedure. Meatal stenosis was more commonly observed in MAGPI procedure. Observed P valve of 0.02 between two procedure is significant statistically.

Conclusion: The MAGPI procedure was found to have better results as the fistula rate was significantly less in spite of the frequent meatal stenosis

Key words: Distal hypospadias, MAGPI procedure, Mathieu procedure.

INTRODUCTION

The term hypospadias is derived from the Greek prefix "hypo" meaning below and "spadon" meaning rent or defect. Hypospadias is a common congenital abnormality of the penis, which results in various degrees of deficiency of the urethra, corpus spongiosum, corpora cavernosa and prepuce. The

abnormal urethral opening may be at any place along the shaft of the penis or it may open into perineum. Fibrous bands extend from the hypospadiac meatus towards the glans. These bands along with the deficient and thin ventral penile skin form a curve in the shaft of the penis, known as chordae .The prepuce is deficient ventrally and forms a dorsal hood over the glans[1].

Depending upon the severity of hypospadias, the patient experiences varying degree of functional disability. Although, as a rule, the hypospadiac meatus does not significantly obstruct the flow of urine, the stream may be deflected ventrally. When the meatus is more proximal, the stream flows straight downwards or backwards resulting in urination" ad modum feminarum".[1] Sexually the dystopic meatus may cause psychological problems and by causing difficulty in semen delivery can affect fertility. The correction of hypospadias remains one of the most challenging problems in urologic surgery and the variety of repair procedures available for this anomaly testifies to this fact. The object of therapy is to construct a straight penis with a meatus as close as possible to the normal site, with ultimate goal of allowing a forward directed stream and normal coitus[2].

MATERIAL AND METHODS

The period of study was one year from Jan 2002 to Dec 2002. Every child was admitted in the ward, a day prior to surgery. His name, age, height, weight and address were recorded. Familial incidence of hypospadias, history of maternal illness or drug intake during pregnancy were also noted. The hypospadias was classified according to the location of meatus into glandular, coronal, subcoronal, distal penile, mid penile, proximal penile, penoscrotal, scrotal & perineal. Only glandular, coronal and subcoronal hypospadias without chordee were selected. The procedures used were Meatal Advancement Glanduloplasty (MAGPI) and Mathieu.

MAGPI procedure was performed in group I consisting of 20 children who had glandular and coronal hypospadias without a groove in the glans. Mathieu repair was used in group II which comprised of 20 children who had coronal hypospadias with a grooved glans. Intraoperative hemostasis was achieved by using a torniquet. The suture material used was 6/0 vicryl, both for urethral construction and skin closure. Urethral catheter was used in Mathieu but not in MAGPI. Dressing used postoperatively consisted of sufratullae and gauze. Penis was anchored to the anterior abdominal wall by using adhesive tapes. Patients were kept in hospital for 1-7 days, and antibiotics and analgesics were given. To avoid blockage the urethral catheter used in children with Mathieu repair, was flushed with normal saline twice daily. On 7th postoperative day, the catheter and dressing were removed in the operation theatre. A note was also made of any complication. Patients were followed for 3-6 months.

RESULTS

Fifty patients with hypospadias were admitted to paediatric surgical ward during

AGE AT PRESENTATION

Age in years	No. of patients	Percentage
0-1 Years	2	4%
1-2 Years	8	16%
2-4 Years	16	32%
4-6 Years	11	22%
6-8 Years	8	16%
8-10 Years	5	10%
Total	50	100%

TABLE-1

TYPES OF HYPOSPADIAS

Type of Hypospadias	No. of patients	Percentage
Glandular	08	16%
Coronal and Subcoronal	32	64%
Other types of hypospadias	10	20%
Total	50	100%

TABLE–2

this one year period. Out of these, forty children having distal hypospadias without chordae were selected for this study excluding the other types of hypospadias. In the remaining 10 patients staged procedures were used and these were not included in this study. The age of patients at presentation is shown in table 1

Various types of hypospadias seen in our study are shown in table 2.

Out of these 40 patients, 8 had glandular hypospadias, 32 had coronal and subcoronal hypospadias. The choice for MAGPI or Mathieu was on the basis of location, shape and size of the hypospadiac meatus and quality of the perimeatal skin. Complications occurred in 16 patients showing a complications rate of 40%.

MAGPI was performed in 20 children. Out of these, 8 had glandular hypospadias while 12 had coronal hypospadias. All these patients were operated by one-surgeon. No urinary diversion was used. A circumferential wrap of dressing consisting of a small piece of sufratulle and gauze, was used in all cases. Patients were kept in the hospital for one day. Immediate post-operative complication like urinary retention did not occur in any of the patients. Although edema of the glans occurred in all the patients, there was no difficulty in voiding. Sixteen patients had excellent functional and cosmetic results. Complications occurred in four children. Three developed meatal stenosis at two months, while the fourth one developed meatal regression four months following repair. The complication rate was 20%. (table-3)

Mathieu repair was performed in 20 children who had coronal and sub-coronal hypospadias. Urinary diversion in the form of a urethral catheter was used in all. Penile dressing consisted of sufratulle and four layers of gauze and the penis was supported to the anterior abdominal wall using adhesive tapes. The urinary catheter was washed with normal saline, twice daily. Children were kept in the hospital post operatively for seven days. On the seventh day dressing and catheter was removed in the operation theatre. All patients developed penile edema. Six patients had developed urethrocutaneous fistula by the time of first followup. Two patients developed meatal retraction at 3 months following repair. Urethral stricture developed in two patients. Eight patients had good functional and cosmetic results. The complication rate was 60% (table 3).

To test the statistical significance of the two procedures chi-square test was applied which is 5.10 and the p value observed was

COMPLICATIONS OF HYPOSPADIAS REPAIR

Procedure	No. of patients	Meatal stenosis	Meatal retraction	Fistula	Stricture	Percents
MAGPI	20	3	1	–	–	20%
Mathieu	20	2	2	6	2	60%
Total	40	5	3	6	2	40%

TABLE–3

0.02 which is <0.05 and therefore has a statistical significance.

DISCUSSION

Hypospadias is a common congenital abnormality of the penis with a reported incidence of one in three hundred live births[02]. The correction of hypospadias remains one of the most challenging problems in urologic surgery. The multiplicity of procedures described for hypospadias repair give testimony to both surgical ingenuity in dealing with the anomaly and dissatisfaction with many of the previous solutions [03]. In recent years the surgical management of hypospadias has been characterized by two inter-related trends, firstly towards single rather than staged repairs and secondly towards procedures intended to give cosmetically as well as functionally satisfactory results [04].

In this study anterior hypospadias constituted about 80% of all cases. Middle and posterior hypospadias constituted rest of the 20%. According to Duckett, the meatus position is distal in 65%, in the middle of the shaft in 15% and penoscrotal or scrotal in 20%.[05] Broadly speaking our distribution of various types of hypospadias is in accordance with that reported in the literature.

The most common age at presentation was 2-4 years (32%) while the percentage of patients between 4-6 years was 22%. The percentage of patients under two years was only 4%. While 16% of patients presented between the age of 6-10 years. The reason that majority of patients (54%) presented between the age of 2-6 years was because they were initially seen by the general practitioners or pediatricians and referred at this time considering it appropriate for surgery.

Refinements in microsurgical technique and improvements in anesthesia have allowed the surgeon to perform hypospadias operations on much younger patients without increased risk. The surgery for hypospadias repair is recommended at a younger age and this recommendation stems from an improved understanding of the interplay of various psychological factors in the child with hypospadias. These include sexual orientation, genital awareness, body image and separation anxiety [03]. Schultz and coworkers in an analysis of these factors advised repair between 8 and 14 months of age [06]. These days hypospadias repair is recommended between 3 to 12 months of age. It is believed that penis at this age is of sufficient size to achieve success equal to that at 2-5 years, which was previously popular [01]. Moreover surgery during this period precedes the formation of optimal parental child bonding and genital awareness (18 months). Parental anxiety and guilt are also lessened with earlier correction[03].

In our study MAGPI procedure was performed in 20 patients. Out of these 8 had glandular and 12 had coronal hypospadias. The complications occurred in 4 children (20%). Both proper patient selection and good surgical technique play an important role in the success of MAGPI [11]. In selecting a case for MAGPI repair, the nature of the meatus and the parameatal skin is of paramount importance. The parameatal skin should be thick and pliable, permitting it to be lifted easily off the underlying urethra. This is essential to permit the ventral parameatal skin to be advanced distally. If the parameatal skin is thin or non-pliable then MAGPI procedure is inappropriate[5].

The complications reported most commonly after MAGPI repair are meatal stenosis and meatal regression. Duckett and Synder think that these complications can be avoided if the procedure is properly performed. The glans wings must be brought together ventrally and fixed snugly to assure solid healing to avoid meatal regression[05].

The excellent results reported by Duckett with a complication rate of 1.2% only[02], has not been reproduced by others. Oxen and Whitaker had 9% complication rate[12]. Issa and Gearhart described 8 cases with meatal regression, five attributed to technical failure and three to poor case selection[11]. Hastie et al described a significant meatal retraction problem[13].

Mathieu repair was performed in 20 patients Complications developed in 12 (60%) of cases. An endless list of procedures had been compiled over the years, for distal shaft and coronal hypospadias. The Mathieu repair has proved to be a reliable procedure that can give excellent functional and cosmetic results. Advantages of Mathieu procedure are its reliability and the fact that it has few long term complications. Disadvantage of classical Mathieu procedure is relatively short distance that can be bridged. The role of urinary diversion in Mathieu repair is controversial. Man et al[14] suggested that urinary drainage or urethral stenting is necessary to promote suture line healing. Rabinowitz concluded that urinary drainage in Mathieu repair is unnecessary [15].

Wheeler et al found that the use of stents was associated with a number of complications, like infection, bladder spasms and dislodgment or migration of stent into bladder [16].Vander Werrf JFA et al and Khan U et al reported less complication rate in stented group, in contrast with a complication rate of 18.9% in un-stented group. They concluded that stent obviates urinary retention and minimizes the incidence of fistula and stenosis[17, 18].

We used stents in all of our cases who underwent Mathieu repair. Patients were kept in the hospital for 7 days and catheters were washed twice daily with normal saline. To prevent infection appropriate antibiotic cover was given. None of our patients developed blockage of catheter, bladder spasms or infection. The reported complication rate for Mathieu repair is 10-15%[3,19,20]. The complication rate for the procedures used in our study is higher than that reported in the literature. This may be attributed to inappropriate case selection, lack of sufficient experience and expertise, non-availability of fine instruments and magnifying loupes and improper suture selections. Meticulous technique, gentle tissue handling, fine dissection and minimal tissue insult are crucial for the outcome. Moreover, the study is too limited and the number of patients too small, to draw any definitive conclusions regarding the success and failure of these operative procedures.

CONCLUSION

MAGPI repair in our study was found to have less fistula rate post operatively, required less surgical expertise and short hospital stay. On the basis of this study we recommend MAGPI procedure in distal hypospadias.

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