Original Research Article

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Outcome of hypospadias repair - stentless versus stented repair

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ABSTRACT

Background: This study was undertaken to evaluate the outcome of hypospadias repair with or without stents.

Methods: Total 30 patients below 14 years underwent primary and re-operative hypospadias surgery in NSCB medical college, Jabalpur between September 2006 to September 2007. Out of these 30 patients, 18 were proximal and 12 were distal hypospadias. All patients were operated for hypospadias repair using standard operative techniques. In alternate patient stent was not placed, while urethral stents were kept in place for a week in the remaining half.

Results: In 14 cases early stent removal was done or no stent was placed and in 16 cases late removal of stent was done. In distal hypospadias cases 2 patients developed fistula and both were from the group in which stents were placed. In proximal hypospadias 6 patients developed fistula post operatively, of these 4 were from the early removal group while 2 were from the late stent removal group. The duration of hospital stay was not significantly affected by the duration of stent placement. But doing a MAGPI procedure significantly reduced hospital stays as compared to Snodgrass repair in distal hypospadias. No such difference in hospital stay was associated with different procedures used in proximal hypospadias.

Conclusions: Stent placement can be avoided specially in cases of distal hypospadias to reduce morbidity and post-operative stay in these patients. Repair with stents or without stents did not affect the outcome of hypospadias repair in terms of fistula formation or postoperative stay.

Keywords: Children, Hypospadias, Stentless hypospadias repair

INTRODUCTION

Hypospadias is the most common congenital malformation of the urethra occurring in 1 in 300 male births. Hypospadias is defined as the abnormal opening of the urethral meatus on the ventral surface of the penis or the perineums instead of its tip. Drainage procedures have for long been considered essential in hypospadias correction. Every drainage procedure from an indwelling bladder catheter to suprapubic catheters have been used but the most widely used drainage procedure today is

placing a stent across the junction of the urethra and neourethra draining the urine to the outside on voluntary micturition. These stents are traditionally kept in situ for 2 weeks post operatively. Newer studies debate the period and necessity of stenting in hypospadias surgery. The metal position and the toilet training status of the patients are not important in the use and length of catheterization. Thus the role of stent and the duration of stenting are highly debated with no clear guidelines for the same. This study is an effort to find out the effects of urethral stenting on complication rate in distal

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hypospadias repair, to compare the effect stent removal versus prolonged stenting on complication rates in proximal hypospadias repair and also compare the complication rates in toilet trained and untrained patients with hypospadias.

METHODS

This study was conducted in General surgery department of N.S.C.B. medical college, Jabalpur from 2006 to September 2007. All patients operated for primary and re-operative hypospadias in our institute in the above mentioned period below 14 years of age were included in this study. All patients were operated for hypospadias repair using standard operative techniques. In cases with distal hypospadias, MAGPI was the preferred procedure for glandular hypospadias and Snodgrass repair for coronal and distal penile variety of hypospadias. In patients with proximal hypospadias, Duckett's onlay flap and Snodgrass repair were the techniques of preference. Duckett's tube was also done in cases of penoscrotal hypospadias. Irrespective of the procedure done, in alternate patient stent was not placed, while urethral stents were kept in place for a week in the remaining half. In patients whom the stents were placed the type of stent and duration for which it was kept was noted. All patients had the same protocol of post-operative management and antibiotic treatment. All patients were observed for complications at the end of 14th post-operative day.

The main complication to be observed for was fistula formation. Other complications included meatal stenosis, hematoma formation, flap necrosis, persistent chordee. The data was analyzed with the help of SPSS 11.5 for windows. Appropriate univariate and bivariate analysis were carried out using t-test, z-test were calculated and tested. The critical values for the significance of the results were considered at 0.05 levels.

RESULTS

It was seen that 13 cases were present below the age of 3 years, 9 cases between 3 to 5 years, 3 cases between 5 to 9 years, 5 cases between 10 to 14 years. 17 cases of the series were toilet trained while 13 were not toilet trained. It was seen that 18 cases belonged to rural areas while 12 patients belonged to urban areas. The most common variety was proximal penile type with 10 cases followed by penoscrotal with 8 cases. Among the subtypes of distal hypospadias, glandular variety was most common with 6 cases, followed by distal penile with 4 cases and least common was the coronal type with 2 cases.

The most commonly used procedure was the Snodgrass repair which was used both for proximal and distal of hypospadias. 6 cases of distal hypospadias were done with the MAGPI technique. Duckett's onlay flap was used for 8 cases and Duckett's tube urethroplasty was done in 2 of the studied cases.

In the post-operative period in 14 cases early removal of stents was done or no stent was kept while in the remaining 16 cases the stent was removed late as per already fixed protocol.

In distal hypospadias in a total of 12 cases, 7 cases were toilet training out of which 2 developed a fistula postoperatively. While in the untrained 5 patients no patient developed a postoperative fistula. However the difference between the 2 was not statically significant (P>0.05). In proximal hypospadias in a total of 18 cases, 10 cases were toilet trained out of which 2 developed a fistula postoperatively. While in the untrained 8 patients 4 patients developed a postoperative fistula .However the difference between the 2 was not statically significant (P> 0.05). In distal hypospadias in a total of 12 cases, 8 cases were from a rural locality out of which 2 developed a fistula postoperatively. While in the urban 4 patients no patient developed a postoperative fistula. However this difference between the 2 was not statistically significant (P>0.05). In proximal hypospadias in a total of 18 cases, 10 cases were from a rural locality out of which 3 developed a fistula postoperatively. While in the urban 8 patients, 3 patients developed a postoperative fistula. However the difference between the 2 was not statistically significant (P>0.05).

In distal hypospadias in a total of 12 cases, 6 cases were of the glandular variety and 2 were of the coronal variety out of which none developed a fistula postoperatively. While in the 4 patients of the distal penile type 2 patients developed a postoperative fistula. However the difference in fistula rates between the different subtypes was not statistically significant (P>0.05). In proximal hypospadias in a total of 18 cases, 10 cases were of the proximal penile type out of which 3 developed a fistula postoperatively. While in the 8 patients of the penoscrotal variety 3 patients developed a postoperative fistula. However the difference between the fistula rates in the 2 subtypes of proximal hypospadias was not statistically significant (P>0.05).

In distal hypospadias in a total of 12 cases, 6 cases were operated using the MAGPI Technique out of which none developed a fistula postoperatively. While in the 6 patients operated using the Snodgrass urethroplasty 2 patients developed a postoperative fistula. However the difference in fistula rates between the different types of repair for distal hypospadias was not statistically significant (P>0.05). In proximal hypospadias in a total of 18 cases, 8 cases were operated using the Duckett's on lay flap out of which 1 developed a fistula post-operatively. While in the 8 patients operated using the snodgrass urethroplasty 3 patients developed a postoperative fistula, while both patient operated using the Duckett's tube technique of urethroplasty developed a fistula. However the difference between the fistula rates in the defferent technique in proximal hypospadias was not statiscally significant (P>0.05).

In distal hypospadias in a total of 12 cases, in 6 cases no stent was placed out of which none developed a fistula postoperatively. While in the 6 patients in which a stent was placed 2 patients developed a postoperative fistula. However the difference in fistula rates between the stented and unstented groups was not statistically significant (P>0.05). In proximal hypospadias in a total of 18 cases, in 8 cases stents were removed early out of which 4 developed a fistula postoperatively while 10 patients in whom delayed stent removal was done only 2 patients developed a postoperative fistula .However the difference between the fistula rates in the early removal group and late removal groups was not staisfacally significant (P> 0.05). It was seen that in the 12 cases of distal hypospadias, in the 6 cases in which stent was not placed the hospital stay was less than 7 days. It was increased to more than 7 days in 3 of the 6 cases in whom a stent was placed. But this difference was not statistically significant. In the 18 cases of proximal hypospadias, in the 8 cases in which early removal of stent was done the post-operative stay was <14 days. It was increased to more than 14 days in 2 of the 10 patients in whom delayed removal of stent was done. Even this difference between the two groups was not found to be statically significant.

The above (Table 1) shows mean post-operative hospital stay according to type of repair done. It shows that in distal hypospadias MAGPI had a mean post-operative hospital stay of 3.83 days and that of Snodgrass pair was 9.66 days. The difference between the two was statistically significant with P<0.005.

Type of hypospadias	Repair	Mean	N	Std. deviation
Distal	MAGPI	3.8333	6	1.6021
	Snodgrass*	9.667	6	4.6332
	Total	6.7500	12	4.4949
Proximal	Duckett's onlay	11.0000	8	2.3299
	Snodgrass	10.7500	8	2.6592
	Duckett's tube	13.5000	2	3.5355
	Total	11.1667	18	2,5725

Table 1: Study of mean hospital stay according to type of hypospadias and repair.

In proximal hypospadias the mean post-operative stay of Duckett's onlay was 11 days, that of Snodgrass was 10.75 days and of Duckett's tube was 13.5 days. There was no significant difference among these three procedures as far as post-operative stay goes.

In distal hypospadias in a total of 12 cases, no case developed meatal stenosis postoperatively. In proximal hypospadias in a total of 18 cases, in 8 cases stents were removed early out of which none developed meatal stenosis postoperatively. While in the 10 patients in whom delayed stent removal was done 2 patients developed a meatal stenosis. However the difference between the fistula rates in the early removal group and late removal groups was not statistically significant (P>0.05).

In this study of outcome of hypospadias surgery with or without urethral stents we found that the age group of patients was 1 to 13 years of age. Majority of the patients (70%) were under the age of 5 years. Of the studied cases 17 cases were toilet trained while 13 were not toilet trained. Toilet training status did not affect fistula rate in both proximal and distal variety of hypospadias. 18 of study patients belonged to a rural area while 12 lived in urban area. Locality of residence did not affect fistula rates in both proximal and distal hypospadias. Of the 30 cases 12 were of distal hypospadias while 18 were of

proximal hypospadias. Of the distal variety 2 were coronal, 6 were glandular and 4 were of distal penile type. Of the proximal variety 10 were of proximal penile type and 8 were penoscrotal variety. The type of hypospadias did not affect the fistula rate in this study. In 14 cases early stent removal was done or no stent was placed and in 16 cases late removal of stent was done. In distal hypospadias cases 2 patients developed fistula and both were from the group in which stents were placed. In proximal hypospadias 6 patients developed fistula post operatively, of these 4 were from the early removal group while 2 were from the late stent removal group. The duration of hospital stay was not significantly affected by the duration of stent placement. But doing a MAGPI procedure significantly reduced hospital stays as compared to Snodgrass repair in distal hypospadias. No such difference in hospital stay was associated with different procedures used in proximal hypospadias.

DISCUSSION

This study was done in a total of 30 cases of different types of Hypospadias. Of these cases 18 cases (60%) were from a rural locality while 12 cases were from Jabalpur itself (40%). Of these cases 13 cases were not toilet trained i.e age < 3 years while 17 cases were toilet trained i.e. age >3 years. The mean age of presentation at our institute was 5 years. These figures show that

majority of the patients present late in our institute as compared to the series by O'Sullivan in which the median age of the patients is as low as 21 months and series by Aslan in which the median age was 40.4 months.²

With respect to the types of hypospadias of the 30 cases, 12 cases were of the distal type (40%) and 18 cases were of the proximal variety of hypospadias (60%). This distribution is unlike the distribution seen in other series in which greater than 50% cases were of the distal type of hypospadias. This difference in the distribution in our institute may be due to failure to seek treatment for minor degrees of hypospadias in study population particularly those of the rural background.

Of the 12 cases of distal hypospadias, 6 were of the glandular type, 2 of the coronal type and 4 of the distal penile type. Of the 18 cases of proximal hypospadias, 10 were of the proximal penile variety while 8 were of the penoscrotal type.

Operation done for each case depended on factors like location of meatus, width of urethral plate, degree of chordee and lastly surgeon preference. So taking all these factors into consideration each operation was done under general anesthesia using optical magnification.

For the cases of distal hypospadias, MAGPI procedure was done for mainly the glandular or coronal variety. While snodgrass urethroplasty was used for distal penile type and one case each of glandular and coronal hypospadias.

For the cases of proximal hypospadias, Duckett's onlay and Snodgrass urethroplasty were used in majority of the cases (16) but Duckett's tube urethroplasty was used in few cases of penoscrotal hypospadias (2) which differs compared to other studies by 0'Sullivan et al in which Mathieu procedure was done in 3 cases, Snodgrass in 39 cases, MAGPI in 18 cases, Ducketts onlay in 1 case and glanular approximation procedures in 4 cases.³ In the study done by Demirbilik et al Mathieu was the preferred procedure for distal variety (52 cases) and for proximal variety Duckett's tube (21 cases) and Duckett's onlay (32 cases) was preferred.⁴

Complications in the post-operative period included mainly post-operative fistula formation which occurred in 8 of the 30 cases of the present study (26%) irrespective of stent duration; however meatal stenosis was also seen in 2 cases of proximal hypospadias repair. This incidence of fistula formation is much higher than that seen in other series of hypospadias repair which is from 7 to 16%. The rate of meatal stenosis i.e 2 in 30 cases was similar to that seen in other series. In the study by 0'Sullivan et al there was meatal stenosis in 3 of the 39 cases.3 In the study by Lorenzo et al there was meatal stenosis in 1 of the 134 patients.⁵ In the study done by Snodgrass et al meatal stenosis was present in 3 of the 137 cases in whom TIP

urethroplasty was done.⁶ In another study using Snodgrass repair done by Holland et al meatal stenosis was present in 3 of the 60 cases.⁷

Post-operative stay is an important consideration in elective procedure like hypospadias repair. In the series by O'Sullivan majority of the cases were treated as day cases (50/65) while most of the admitted cases were discharged on the next day of surgery (1 0/15). 3 However in study setup due to various infrastructural and technical problems it is not possible to operate hypospadias patients on a day care basis. Furthermore due to majority of study patients hailing from the rural area (18/30) it is not possible to cut short postoperative stay as follow up on a regular basis is not possible for most such patients.

In the study done by McCormack et al in 1993 it was seen that urethral stents prolong hospital stay. Even by removal of the stent early or not placing a stent at all, in study patients it has not reduced the postoperative stay by a statistically significant margin. As we can see in distal hypospadias in the 6 cases in which no stent was placed the post-operative period was less than 6 days. It was only increased to more than 6 days in 3 of the 6 patients in which stent were placed. But this difference was not statistically significant. Even in the case of proximal hypospadias the post-operative stay was less than 14 days in patients in whom early stent removal was done. But at the same time it was increased to more than 14 days in only 2 of the 10 patients in whom delayed stent removal was done and this difference was not statistically significant.

Toilet training is thought to be an important factor in deciding the duration of postoperative stent placement. El Sherbiny et al in their study said that use of a stent is advantageous in toilet trained children as it significantly reduced the risk of urinary retention and extravasation and reduces the reoperation rate. However in the study done by Aslan et al it was concluded that toilet training status of patients was not important in the use and length of catheterization. So the role of toilet training status is not established in influencing the results of hypospadias surgery.

In this study it was seen that the toilet training status of the patients didn't affect the postoperative fistula rates both in distal and proximal hypospadias by a statistically significant amount. Furthermore none of the patients of distal hypospadias who were toilet trained and without stents had retention of urine or discomfort. Neither was this seen in cases of proximal hypospadias in whom toilet training was present but the stent was removed early. Hence according to this study toilet training doesn't alter the results of hypospadias surgery as is also stated by Aslan et al. No study associates the locality of residence of hypospadias with complications in hypospadias surgery. But in this set up the locality of residence can help in suggesting the nutritional background of the

patient, the educational and economic status of the patient and parents. Also as majority of patients in our institute are from rural areas it was necessary to see if the results of their surgery differed from the patients from the urban area.

But as the observations show there was no statistically significant difference in complications in the patients from rural area as compared to those from the urban area. Thus just the locality can't predict post-operative results in patients of hypospadias.

Type of hypospadias is regarded as one of the factors determining the postoperative complication rate and postoperative stay of the patient. In the series by O'Sullivan et al meatal position was found to have no impact on post-operative complication rate.³ In this series the position of the meatus was found to have no statistically significant effect on postoperative fistula rates. The type of procedure done is thought to have a bearing on the duration of stenting, post-operative stay and complications. One of the main drawbacks of Snodgrass procedure according to O'Sullivan is the long post-operative stenting leading to longer postoperative stay in study set up.

Also procedures like MAGPI, Thiersch - Duplay are more conducive to no stent approach. Demirbilik et al also suggested that procedures like Duckett's flap or tube procedure have better results when suprapubic diversion is done for the same.⁴

In this study the MAGPI and Snodgrass urethroplasty were the preferred procedures for distal hypospadias. In proximal hypospadias Duckett's on lay flap and Snodgrass were the preferred procedures.

In this study the type of repair had no significant effect on postoperative complication rate in both proximal and distal hypospadias. However it was seen that doing a MAGPI procedure in distal hypospadias decreased postoperative stay as compared to Snodgrass urethroplasty for the same type of hypospadias. In the procedures used for proximal hypospadias the type of procedure didn't alter the post-operative stay significantly. We have attempted to remove stents early in all types of repair to see if this has any effect on the fistula rates.

The role of stenting in hypospadias surgery has been debated in recent times. First the transition from bladder drainage catheter to urethral splent was done by Pike et al in 1991 who said that these reduce post-operative stay and minimal short term complications. Then even the role of these urethral stents was debated as various studies done not using stents in various procedures for distal hypospadias. McCormack et al did unstented Mathieu repair and found no difference in complication rates and reduced postoperative stay. However Buson et al did a similar study and concluded that stent placement is advantageous for the outcome of Mathieu operation. 11

Hakim et al also did a study comparing stented and unstented Mathieu repair and found no difference in fistula rates in the 2 groups. ¹² Thus 3 different studies have shown 3 different results with respect to a particular procedure.

Snodgrass repair has revolutionized hypospadias surgery since its introduction in. The main problem with the TIP technique was the prolonged stenting time. But now various studies in which stentless hypospadias surgery were done. Also Snodgrass repair can be used for fistula repair. Le Clair et al did a study in which foreskin reconstruction was added to TIP urethroplasty. They found no difference in postoperative complication rate in the stented and stentless groups. The stented and stentless groups.

O'Sullivan et al studied the role of stents in Snodgrass repair and concluded that stents can be safely done away with in distal hypospadias repairs.³ In the present study out of 6 patients of patients with stents in distal hypospadias 2 developed a fistula as compared to none of the 6 unstented patients, although this difference was not statistically significant. El Sheribiny et al studied if stents should be left in toilet trained children after TIP urethroplasty. They concluded that placement of a stent reduces the rate of retention and urinary extravasation in toilet trained children post TIP urethroplasty. In this study there was no difference in fistula rate in toilet trained and untrained children irrespective of the presence or absence of a stent and duration of stent placement.

Aslan et al studied the factors which determine the duration of stent placement post TIP urethroplasty. They found that the patients with short term catheterization had similar outcomes to patients with stents for 7- 14 days. Toilet training, position of meatus was not important in determining the duration of stent placement. As far as proximal hypospadias goes there is a general consensus that stent placement is essential in proximal repairs. Demirbilik et al even suggested that suprapubic diversion is advantageous for Duckett's onlay and tube surgeries for proximal hypospadias. But no study to authors knowledge has compared complication rates in early and late stent removal in proximal hypospadias surgery.

In the present study it was seen that there was no difference in post-operative fistula rates in unstented and stented patients in distal hypospadias surgery, but at the same time there was no difference in post-operative stay between the two groups. Even when it came to proximal hypospadias there was no difference in fistula rates and post-operative stay in patients in whom stent was removed after 5 days and in patients in whom the stent was kept conventionally for 10 - 14 days.

CONCLUSION

From this study authors can conclude that stent placement can be avoided specially in cases of distal hypospadias to reduce morbidity and post-operative stay in these patients. But also at the same time delayed stent removal should be done in proximal hypospadias till further studies confirming the advantage of early stent removal in these cases are done. However toilet training does not alter the results of hypospadias surgery.

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REFERENCES

- Retik AB, Borer JG. Hypospadias, Campbell's Urology, Eighth edition, Saunders Philadelphia, Pennsylvania; 2002:2284-2333.
- 2. Aslan AR, Yucebas E, Tekin A, Sengor F, Kogan BA. Short term catheterization after TIP repair in distal hypospadias: who are the best candidates? Pediatr Surg Int. 2007;23(3):265-9.
- 3. O'Sullivan O, Bannon CA, Flood H. The Snodgrass repair: is stenting always necessary? Ir Med J. 2006;99(3):71-3.
- 4. Demirbilek S, Atayurt HF. One stage hypospadias repair with stent or supra pubic diversion: which is better? J Pediatr Surg. 1997;32(12):1711-2.
- 5. Lorenzo AJ, Snodgrass W. Regular dilatation is unnecessary after tabularized incised plate hypospadias repair. BJU Int. 2002;89(1):94-7.

- 6. Snodgrass W. Tubularized incised plate urethroplasty for distal hypospadias. J Urol. 1994;151(2):464-5.
- 7. Holland AJA, Smith GHH, Crass DT. Clinical review of Snodgrass hupospadias repair. Aust NZJ Surg. 2000;70:597-600.
- 8. El- Sherbiny MT. Tubularised incised plate repair of distal hypospadias in toilet trained children: should a stent be left? BJU lnt. 2003;92(9):1003-5.
- 9. Pike JG, Brzezinski A, Kirulata GH. Use of a urethral splent in one stage hypospadias repair. Can J Surg. 1991;34(5):507-9.
- McCormack M, Homsy Y, Laberge Y. No stent, no diversion Mathieu hypospadias repair. Can J Surg. 1993;36(2):152-54.
- 11. Buson H, Smiley D. Distal hypospadias repair without stents: is it better? J Urology. 1994;151:1059-60.
- 12. Hakim S, Merguerian PA, Rabowitz R, Shortlife LD, McKenna PH. Outcome analysis of the modified Mathieu hypospadias repair: comparison of stented and unstented repairs, J Urol. 1996;156:836-8.
- 13. Leclair MD, Camby C, Battisti S, Renaud G, Plattner V, Heloury Y. Unstented TIP urethroplasty combined with foreskin reconstruction for distal hypospadias. Eur Urol. 2004;46(4):528-30.

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