INTRODUCTION

Congenital anomalies of anus and rectum are relatively common. The reported incidence is 01 per 5000 live births, with male preponderance. The most useful clinical classification categorizes lesions according to the position of the rectum in relation to the puborectalis muscles sling. Most males have high lesions, while females have intermediate or low types of anomalies. Anorectal malformations in female patients have been treated in many different ways with various modifications. Many procedures described earlier had limitations like incomplete exposure, blind tunneling of rectum, lack of reconstruction of perineal body with anterior migration of anus at long-term follow-up.

Since the introduction of Posterior Sagittal Anorectoplasty (PSARP), most surgeons have adopted the technique. Despite the reported good results, it is associated with some technical difficulties. In this approach patient is placed in prone position, which is difficult to manage. A special precaution is needed to prevent injuries to femoral nerve and feet. Hyperextension of spine has to be avoided by careful placement of soft roll under chest and groin. Anaesthetist's approach to face and chest is also restricted. Special precautions, therefore, have to be adopted for monitoring. If procedure is to be combined with abdominal approach, as required in high lesions, then the position of the patient has to be changed to supine, thereby compromising the sterilization of the field and adjustment of the entire surgical field set-up.

The anterior sagittal approach is another technique devised for managing these lesions. It was first reported by Zanotti in 1988. The first reported series appeared in 1992, with all cases showing satisfactory results. In this approach, patient is placed in lithotomy position, sphincter muscles are entered under direct vision and puborectal muscle is preserved. The advantages reported with this approach include convenient position of patient, good exposure of operative field, adequate mobilization of rectum, and

ABSTRACT

Objective: To determine the technical applicability and early postoperative outcome of anterior sagittal approach for anorectal malformations in female children.

Study Design: Case series.

Place and Duration of Study: Surgical Unit B of National Institute of Child Health (NICH), Karachi, from April to November 2007.

Methodology: Female patients with congenital anorectal malformation who underwent anorectoplasty through anterior sagittal approach were included in the study. Surgery was done either as primary or staged procedure (with initial colostomy or cut back). Operative details were recorded. Follow-up was done in OPD.

Results: Thirty patients with mean age of 11.5 months underwent anorectoplasty through anterior sagittal approach. Eighteen patients had ASARP as a primary procedure. Staged procedure with initial colostomy was done in 9 patients. Initial cut back was done in 2 cases and one redo surgery done. Vaginal tear occurred in one, while partial tear of most distal part of fistula occurred in 4 children. At follow-up, 2 patients with primary ASARP developed wound infection with superficial disruption. Bleeding with wound disruption occurred in one case. Anal mucosal prolapse, anastomotic stricture and recurrent fistula occurred in one patient each. Cosmetic appearance of perineum was good in 10, satisfactory in 5 and poor in 3. Among patients staged with colostomy, bleeding with wound disruption, anal stenosis and retraction occurred in one case each. Cosmetic results were good in 7, satisfactory and poor in one case each. Two patients with initial cut back did not have any complication and one operated for disrupted wound developed disruption again.

Conclusion: Anorectoplasty can satisfactorily be done through anterior sagittal approach in females with anorectal malformations. Primary ASARP has almost the same results as staged procedure, which should be done in selected patients.

Key words: Anorectal malformations. Anterior sagittal approach. Anterior Sagittal Anorectoplasty (ASARP). Female. Children.
near normal reconstruction of perineal body. Similar results as that of PSARP are reported with this technique. This procedure can be done either as primary procedure or staged in selected cases with initial colostomy.

Keeping in mind the technical difficulties faced during PSARP procedure and advantages described in few reported series on anterior sagittal anorectoplasty, this study was conducted to determine the outcome of anterior sagittal approach for anorectal malformations in female children.

**METHODOLOGY**

The study was conducted in Surgical Unit B, Department of Paediatric Surgery, National Institute of Child Health, Karachi, from April to November 2007. Female patients of imperforate anus with rectovestibular, anovestibular and anocutaneous fistulae were included. Imperforate anus without fistula, ectopic anus and cloacal malformation were excluded. All patients who were in otherwise good health, having fistula that was easily seen on perineal examination were subjected to primary surgery irrespective of its type. Those patients who had tiny fistula located deep in fourchette, sick and the older children with history of significant constipation etc. had colostomy as an initial procedure followed by ASARP. Three patients underwent an initial procedure of either a cut back or disruption following previous surgery.

Technical applicability was described in relation to anaesthesia administration and surgical procedure that included induction of anaesthetic agents and patients monitoring in supine position, approach to the anomaly (operative field), extent of dissection, reconstruction of perineal body and anoplasty. Pre-operatively, all patients were kept on regular bowel wash for 2-3 days, oral metronidazole, and only clear liquids were allowed. Under general anaesthesia, patient was kept supine in modified lithotomy position with thighs and legs supported on soft cushions. Surgeon was at the foot end of the table. A circular incision was made in the mucocutaneous junction around fistulous opening, extending posteriorly along midline to reach proposed anal site, located by electrical nerve stimulation. The fistulous opening was then gently freed from surrounding tissues to avoid damage to the musculature enclosing the rectum and genital tract. Adherent common wall between rectum and vagina was then dissected out. After gaining adequate rectal mobilization, it was placed in the center of sphincter complex. Anterior ends of muscles were sutured in layers with polyglycolic 3/0 to enclose the rectum. Tacking stitches were also applied between anterior wall of the rectum and anterior muscles (perineal body) to prevent rectal mucosal prolapse. Anoplasty was performed with 5/0 polyglycolic sutures. Subcutaneous tissue and perineal skin were then closed. Post-operatively, the patients with primary procedure were kept nil per orum for 24 hours, while those with colostomy were allowed oral intake within 6-8 hours. After discharge, patients were followed in OPD at 15, 30, and 90 days. Postoperatively anal dilatations were at the first follow-up started and continued with increasing size at monthly interval according to the age of the patients.

Early postoperative outcome was described in terms of bleeding, infection, wound disruption, rectal prolapse, stricture, retraction, recurrent fistula and cosmetic results. The results were entered into Microsoft Excel program for statistical analysis. Percentages of various types of complications were computed.

**RESULTS**

A total of 30 females with anorectal malformations underwent anorectoplasty through anterior sagittal approach. The age ranged from 2.5 months to 7.5 years. Only 6 patients were under 6 months of age. Vestibular fistula was the commonest variety, found in 13 patients (Table I). Three of the patients had local associated anomalies found on examination under anaesthesia. One had vaginal atresia along with rectovestibular fistula while 2 had septate vagina. Eighteen patients had ASARP as primary procedure. The age in that group ranged between 2.5 months and 3 years (mean 11.5 months). ASARP staged with colostomy was done in 9 patients with age ranging between 5 months and 7.5 year (mean 43 months). Initial cut back was performed earlier in 2 and one patient was operated as redo surgery. She had underwent primary surgery elsewhere. Anterior sagittal approach provided good exposure of operative field and mobilization of rectum to give adequate length. There was always a long common sharing wall between rectum and vagina irrespective of the type of anomaly.

| Table I: Age distribution and type of anomaly. |
|----------------|----------------|----------------|
| Age group      | Primary procedure | Staged procedure |
|                | Vestibular fistula | Cutaneous fistula | Vestibular fistula | Cutaneous fistula | H type fistula |
| < 6 months     | 2               | 2               |                   | 1               | 1             |
| 6 months-1 year| 4               | 5               | 1                  | 1               | 1             |
| 1-3 years      | 3               | 1               | 1                  | 1               | 1             |
| 3-5 years      | -               | -               | 1                  | 1               | -             |
| > 5 years      | -               | -               | 1                  | -               | -             |

Among the 18 patients of primary group, 3 patients with vestibular and 2 with cutaneous fistula developed complications in the early postoperative period. Infection with wound disruption occurred in 2, bleeding with complete wound disruption occurred in one, and one case each developed anal mucosal prolapse, anastomotic stricture and recurrent fistula respectively. Re-operation (colostomy followed by ASARP) was done...
for wound disruptions and recurrent fistula, mucosal trimming was done in the patient with prolapse and anal dilatation was carried out for stricture. Cosmetic appearance of perineum at follow-up was good in 10 (fine scar of surgery) and satisfactory in 5 (wide scar) while 3 had poor results (disrupted).

Out of the 9 patients staged with colostomy, complications occurred in 3 patients, 2 with vestibular fistula and one with cutaneous fistula. One patient had bleeding with wound disruption. Anal stenosis and partial retraction of stump occurred in one patient each. Cosmetic results were good in 7, satisfactory in one and poor in one. Re-surgery (ASARP) was done in one with wound disruption, while anal dilatation was required for stenosis. Two patients with initial cut back did not have any complication and result was satisfactory, while the child operated for disrupted wound had disruption again.

Overall cosmetic results were good in 63.33% of patients, satisfactory in 20%, and poor in 16.66% cases. Functional outcome was not assessed as a majority of children were below the age of attainment of fecal and urinary control. This issue has to be assessed only at long-term follow-up (Table II).

Table II: Early postoperative results.

<table>
<thead>
<tr>
<th>Complications</th>
<th>Primary ASARP n=5</th>
<th>Staged procedure n=5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mucosal prolapse</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Anal stenosis</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Recurrent fistula</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Partial retraction of stump</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Bleeding with wound disruption</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Infection with wound disruption</td>
<td>2</td>
<td>-</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Anorectal malformations with fistula are common congenital anomalies found in female patients. The spectrum of defect varies considerably even with fistulas of same location. The goal of all the corrective surgical techniques is anatomical reconstruction of anorectal region in order to maximize the potential for normal bowel function and continence. Since the introduction of posterior sagittal anorectoplasty in 1982, it became the procedure of choice, as it was reported to be associated with less number of complications and good functional outcome. Anterior sagittal approach of anorectoplasty for anorectal malformations in female patients was introduced in 1988 and had been in use since then. According to various studies, this technique provides good anatomical exposure to operative field and minimizes the sphincter and other important structures damage.

The most common variety of anorectal malformations found in the present study was imperforate anus with rectovestibular fistula. This is grouped as intermediate type on Wingspread classification. Although most of the patients reported in western literature presented in neonatal period as they are easily recognized, but in this study, only 20% (n=5) patients presented under 6 months of age. The youngest was 2.5 months of age. This could partly be due to lack of awareness regarding the anomaly or because of the anocutaneous type may be perceived as normal. Surgical consultation is usually taken when patient develops severe constipation or abdominal distention. The delay in presentation also affects later development of voluntary, functional control over defecation as the cortical integration of somatosensory input may be lost in later age if anomaly remains untreated.

The patients were grouped into two, one in whom primary ASARP was performed and the other who underwent staged procedure. Choice of procedure was made according to the symptoms, signs and general condition. Patients with severe constipation, abdominal distention, narrow fistulous opening or excoriation of the surrounding area had initial colostomy followed by ASARP. Those with poor general condition underwent initial cut back. Rest had primary ASARP. Age of patient was also considered and most of those older than one year had initial colostomy as also practiced by others. Lithotomy position, as adopted in ASARP, is comfortable for anaesthetist both for administering anaesthesia and monitoring the patient. This gives good exposure of operative field, visualization of relevant muscles under direct vision and better mobilization of rectum all-around. Common sharing wall between rectum and vagina has to be separated for adequate mobilization of rectum. Separation of this common wall is the most difficult part of the operation. It is usually very thin at the level of fistula, the size of which varies in different cases. It got torn in 4 patients of this series. This does not affect the outcome as it is usually excised at the time of anoplasty. The anterior sagittal approach provided complete and comfortable exposure to this part of dissection. Meticulous dissection is necessary in order to avoid tear in rectum or vagina as one proceeds proximally. In only one case, vaginal tear occurred during dissection. Tear should be repaired to avoid the recurrent fistula. If rectum remains intact during dissection and does not retract later, chances for recurrent fistula are minimal. In this study, one of the patients had fistula recurrence because rectal stump was partly retracted.

In this approach only anterior part of sphincter has to be cut. Posterior dissection is limited. Perineal body construction is greatly facilitated. Its good healing is a key to near normal looking perineum. In present study, some of the patients had poor cosmetic results, which was due to delayed healing and partial disruption of the wound. Hemostasis must be secured before closing the perineal body muscles. This would minimize post-operative oozing and thus prevent infection and
subsequent disruption. The superficial wound disruption usually heals in a couple of weeks while major disruption resulting from infection or inadequate reconstruction of perineal muscles, needs repeat surgery. Wound healing is also dependent upon the patient’s general health and perineal skin status. In patients with severe inflammation at the perineum, healing is delayed, which contributes to wound disruption. Complete evacuation of stool from distal bowel is of importance, as presence of faecalomas also contributes to wound disruption. Redo surgery in this region is always difficult and not very successful. Three of the patients in present study with primary and one with staged procedure had complete wound disruption. In all of them covering colostomy was followed by the redo-ASARP. At operation, intense fibrosis was found and separation of rectum and vaginal wall was very difficult.

Postoperatively, the inflammation and wound healing usually occur after 2 weeks. Patients should then be kept on regular anal dilatations with appropriate sized dilator in order to prevent the anal stenosis or stricture. This requires education of the parents about importance and method of anal dilatation. As no regular dilatation was done in 2 of the patients in the present study, they developed anal stenosis. One patient developed mucosal prolapse. The usual reported incidence in literature after PSARP is 3.8%. It is reported that one to two tacking stitches between rectum and muscle are complex and anoplasty under slight tension can help in preventing mucosal prolapse. Although PSARP is considered as the best approach for anorectal malformations but reports are available which show almost similar results as in the present study.

It was observed in the study that primary ASARP gives nearly the same results as that staged with colostomy especially in younger patients. So three staged procedure can be avoided in these, while patients with inflamed perineal skin and severe constipation can have initial colostomy followed by ASARP. At 3 months follow-up, 63% patients showed good cosmetic results while 20% had acceptable results. Good meant nearly normal appearance of perineum with minimal wound scaring. Acceptable were those with mild wound infection resulting in wide scar at 3 months but no wound disruption. In 4 patients, results were poor as they had complete wound disruption or recurrent fistula and had to undergo re-operations. Pena described similar complications.

In this study, the number of patients was small. Complications occurred in only a few. For proving statistical significance, a large cohort of patients and a comparative study is needed. It was found that as most of the patients were below 3 years of age and follow up period was also short. Therefore, it is too early to comment upon functional outcome related to continence. For this, a long-term follow-up is required. However, in initial 3 months follow-up, 4 patients developed constipation but were settled on oral laxatives.

CONCLUSION
Anorectoplasty can successfully be done through anterior sagittal approach for congenital anorectal malformations in female patients. The approach provides good exposure and results in acceptable cosmetic results.

REFERENCES


