Original Article

Primary Anterior Sagittal Anorectoplasty Shift from Staged to Single-stage Procedure for Low Anorectal Malformations in Female Children: Our Initial Experience in Single Centre

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Abstract

Background: Anorectal malformation (ARM) is a common congenital anomaly found in the paediatric age group. Previously, the repair of the vestibular fistula (VF) was performed as three-stage procedure with initial colostomy followed by a definite procedure and, lastly, colostomy closure. At present, a single-stage procedure is preferred, especially in lower anomalies owing to the convenient and time-saving approach. **Objective:** The clinical profile and outcome of ASARP for treatment of ARM in females (vestibular anus and perineal fistula). **Methods:** A retrospective analytical study was conducted at Government Medical College, Jammu. A total of 60 patients were included in the study. **Results:** Most of the patients were in the age group of 1–5 years (30%), followed by 6 months–1 year age group (25%). Forty-five (75%) females had VF while 15 (25%) had perineal fistula. Intraoperative complication was vaginal tear seen in 6 (10%) patients followed by rectal tear seen in 3 (5%) patients. Early post-operative complications were seen in 9 (15%) patients. Wound infection was the most common complication seen in 5 (8.3%) patients, wound dehiscence in 3 (5%) patients and retraction of rectum in 1 (1.6%) patient. Late post-operative complications were seen in 24 (40%) patients. Perineal excoriation was the most common complication seen in 6 (10%) patients, constipation seen in 5 (8.3%) patients, anal stenosis in 4 (6.6%) patients and mucosal prolapse in 4 (6.6%) patients. **Conclusion:** The single-staged ASARP procedure resulted in satisfactory outcomes. It is an excellent procedure for females with VF and perineal fistula. Appropriate selection, preparation of patient, optimal correction with minimal sphincter damage and needful post-operative care of wound give excellent cosmetic and functional outcomes in terms of continence. It also decreases the burden on treating the surgeon, family and psychological stress on the patients and parents.

Keywords: Anal stenosis, anorectal malformations, anterior sagittal anorectoplasty, perineal fistula, vestibular fistula

Introduction

Anorectal malformation (ARM) is a common congenital anomaly found in the paediatric age group.[1] It is a major disabling congenital malformation with an incidence of 1 in 5000 live births.[2] In females, vestibular fistula (VF) is the most common form of ARM.[3] It is a high type of anomaly with a fistula opening near the vagina at the posterior fourchette.[4] Fistula is adherent to a posterior vaginal wall which is directed posteriorly upwards.[3] When properly treated, patients with VF have a good prognosis in terms of bowel function.[4] The most common approaches currently in use are posterior sagittal anorectoplasty and anterior sagittal anorectoplasty (ASARP) with or without covering the stoma.[5,6]

Previously, the repair of VF was performed as a three-stage procedure with an initial colostomy operation. At present, a single-stage procedure is preferred, especially in lower anomalies, owing to convenient and time-saving approach. This also avoids multiple surgeries and psychological impacts on the child's social behaviour.[7] The anterior sagittal anorectoplasty was first reported by Zanotti.[8] This procedure may be done with or without a protective colostomy, but most surgeons repair the defect primarily without covering the colostomy.[9]

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Aims and objectives

We aimed to study the clinical profile and outcome of ASARP for the treatment of ARM (vestibular anus and perineal fistula) in females.

Methods

A retrospective analytical study was conducted at Government Medical College, Jammu, from January 2015 to December 2022. A total of 60 patients were included in the study.

Inclusion criteria

All female patients with either VF or perineal fistula were included in the study.

Exclusion criteria

Male ARM patients, cloacae, high ARM and patients with congenital pouch colon were excluded.

All the female patients who were diagnosed as a case of ARM with VF and perineal fistula were included in the study and managed by ASARP. The diagnosis was made by clinical examination. Pre-operative investigations included haemograms, kidney function tests, serum electrolytes and blood glucose. Patients were assessed for associated anomalies with ultrasound abdomen (ultrasonography [USG] kidneys, ureters and bladder), USG cranium and spine and echocardiography. Informed written consent about the procedure was taken from parents with counselling regarding possible complications that may need stoma formation or redo surgery. All patients were given pre-operative bowel irrigation with normal saline before surgery. Patients were administered intravenous fluids and gut sterilisation with intravenous cephalosporins. The clinical and operative records of the patients were analysed along with associated malformations. All the patients were assessed for intraoperative and post-operative (early and late) complications. Post-operatively, all patients were kept nil per oral for 48–72 h. Parents were advised to keep the wound clean of faecal contamination by regular betadine syringing. Foley's catheter or infant feeding tube was retained for 7–10 days to reduce the contamination by urine. Straining was prevented by avoidance of constipation. Daily assessment of perineal wound was done for any discharge, disruption or infection during hospital stay and patients were discharged at 2 weeks. Patients were reassessed in a follow-up period after 2 weeks.

Technique

The procedure was performed in lithotomy position under general anaesthesia with endotracheal intubation. After proper positioning, urinary catheterisation was done [Figures 1 and 2]. The site of the anus was assured by the anal dimple and marked by silk sutures. The hyperpigmented skin site was a good guide for the proposed anal site. A midline incision was made from the posterior margin of the fistula to the posterior limit of the proposed anus. The incision was deepened and all the tissues including perineal muscles and external fibres of the external sphincter complex were divided strictly in the midline, and the posterior wall of the rectum was exposed. Posterior to the rectum, there is a well-defined plane and with sharp and blunt the posterolateral rectal wall was separated from the adjacent musculature. Gentle finger dissection with restricted use of cautery was done for inflicting minimal damage to neurovascular bundles/fibres. Separation of the anterior wall of the rectum from the posterior wall of the vagina was the most crucial stage of the procedure. It began with the placement of multiple fine silk traction sutures around the fistulous opening for traction. This was followed by infiltration of normal saline in the common lip (wall) between the rectum and the vagina. The rectum was separated from the posterior vaginal wall (which is without proper demarcation) by sharp and blunt dissection. It requires extreme patience, gentle and sustained traction (stay sutures), and proper assistance and experience. Once the plane of cleavage between the vaginal and rectal walls was achieved, it became easier to separate these two. Anterior dissection between the posterior vaginal wall and the rectum was done up to the level of the cervix. Mobilisation of the rectum was performed circumferentially till the fistulous opening reaches the proposed site of neoanus without tension [Figure 3]. The rectum was placed



Figure 1: On table photograph showing vestibular fistula



Figure 2: Photograph showing vaginal opening (above) and vestibular anus (below) delineated inserting feeding tubes

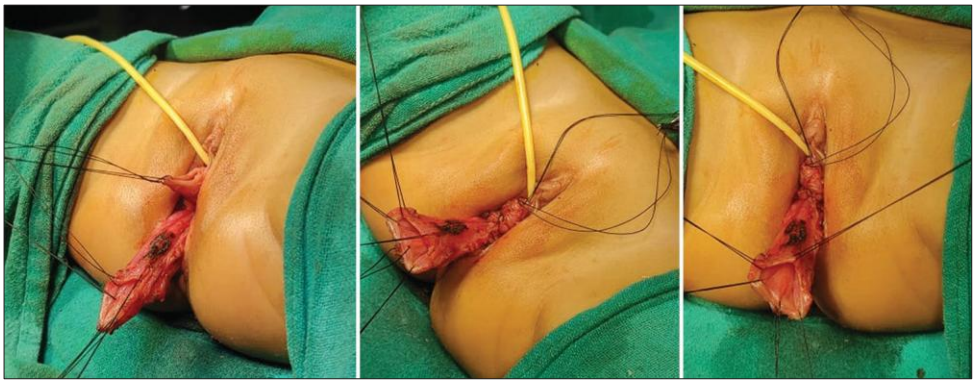


Figure 3: Intraoperative photograph showing dissection and complete mobilisation of rectum



Figure 4: Photograph at completion of ASARP



Figure 5: Photograph of perineal wound 2 months after surgery

in the centre of the muscle complex. The anterior aspect of the muscle complex was then approximated by taking the bowel wall (seromuscular) in the stitches, craniocaudally by interrupted suitably sized absorbable sutures. In some cases, the rectum could be pulled through between the preserved external sphincters. The perineal body was reconstructed anteriorly; the anorectum was fixed to the adjacent musculature circumferentially (prevents recession of the anorectum in case of wound infection). Anoplasty was performed in a classical manner with circumferential (absorbable) sutures of 4-0 or 5-0 [Figure 4]. Vaginal vestibule was repaired with fine sutures, followed by repair of perineal skin. Paraffin-impregnated gauze pack was placed in the neoanus, and a small pad was used for dressing the perineum. In patients with perineal fistula, the procedure was easier than VF. The anorectum was mobilised circumferentially, followed by a complete division of the posterior ledge. The rest of the procedure was similar to VF. Photograph taken two months after surgery showing perineal wound with excellent cosmetic and functional outcome [Figure 5].

Selection criteria for single-stage procedure:

1. Wide mouth fistula
2. Well-formed septum between vagina and rectum.

Measures taken to reduce the operative and post-operative complications:

1. Proper patient selection
2. Good mobilisation and fixation
3. Post-operative wound care with regular betadine syringing
4. Strapping of limbs for the first 2 post-operative days.

Results

A total of 60 patients were included in the study. Most of the patients were in the age group of 1–5 years (30%), followed by 6 months–1 year age group (25%) [Table 1]. Forty-five (75%) females had VF while 15 (25%) had perineal fistula.

A total of 20 patients had associated anomalies. The most common associated anomaly was genitourinary seen in about 20% of patients. Cardiovascular anomaly was seen in four patients and neurological abnormality was seen in two patients [Table 2].

Intraoperative complications were seen in 8 (13.3%) patients. The most common complication was a vaginal tear that occurred in six patients, which was repaired primarily. This was followed by rectal injury occurred in 3 (5%) patients which was also repaired primarily [Table 3].

Table 1: Age distribution of patients

Age of patients	Number of patients (*n*=60)
<1 month	8
1–6 months	12
6 months–1 year	15
1–5 years	18
>5 years	7

Table 2: Associated anomalies of patients with anorectal malformations

Associated anomalies	Number of patients
Genito urinary	12
Septate vagina	3
Imperforated hymen	2
Absent vagina	1
Double Mullarian system	3
VUR	3
Small kidney	2
Renal agenesis	1
Cardiovascular	4
ASD	1
VSD	2
Aortic regurgitation	1
Neurological	2
MMC	1
Spina bifida	1
Gastrointestinal	1
EA+TEF	1
Parietal	1
Umbilical hernia	1
Miscellaneous	2
Cleft lip	1
Haemangioma abdomen	1

MMC: Myelomeningocele, VSD: Ventricular septal defect, ASD: Atrial septal defect, VUR: Vesicoureteral reflux, TEF: Tracheo-esophageal fistula, EA: Esophageal atresia

Table 3: Intraoperative complications, management and outcome

Intraoperative complications	Number of patients (*n*=8)	Management	Outcome
Vaginal wall tear	6	Repair	Satisfactory
Haemorrhage	2	Blood transfusion	Satisfactory
Rectal wall injury	3	Repair	Satisfactory
Anaesthesia related	1	Inotropics	Satisfactory

Early post-operative complications were seen in 9 (15%) patients. Late post-operative complications were seen in 24 (40%) patients [Table 4].

Discussion

Out of 60 patients included in the study, 35 (58.3%) patients were below the age of 1 year (12 months). In our study, VF was most commonly seen in about 75% of patients. In the study by Goyal *et al*. and Elrouby *et al*., VF was most commonly seen.[10,11] In the study by Zamir and Rasool 68.57% had a perineal fistula.[12] Associated anomalies (n = 22) were seen in 20% of the patients. The most common associated anomaly was genitourinary seen in about 12 (20%) patients. In the study by Goyal *et al*. and Zamir and Rasool, similar findings were reported.[10,12] In our study, the most common intraoperative complication was a vaginal tear seen in 6 (10%) patients, followed by a rectal tear seen in 3 (5%) patients. In the study by Afzal *et al*., intraoperative vaginal tears occurred in 10.5% of patients and rectal tear occurred in 6.25% of patients.[13] Goyal *et al*. in their study reported 3.82% intraoperative complications with a radial vaginal tear in 1.9% of patients and rectal wall injury in 0.63% of patients.[10] Wound infection was the most common complication seen in 5 (8.3%) patients which was managed with conservative treatment. Wound dehiscence was seen in 3 (5%) patients, out of which two patients were managed by stoma formation while one patient was managed by conservative treatment. Retraction of the rectum was seen in 1 (1.6%) patient and was managed by stoma formation. Afzal *et al*., in their study, reported wound infection in 15.62% of patients and wound disruption requiring redo surgery in 6.25% of patients.[13] Goyal *et al*. reported 5.09% (8) early post-operative complications with wound infection in four patients, wound dehiscence in three patients and retraction of the rectum in one patient.[10] In the study by Zamir and Rasool wound infection was seen in 17.14% of patients and wound disruption in 7.14% of patients.[12] Late post-operative complications were seen in 24 (40%) patients. Perineal excoriation was the most common complication seen in 6 (10%) patients and managed conservatively, followed by constipation seen in 5 (8.3%) patients which was managed by laxatives and anal dilatation. Anal stenosis was seen in 4 (6.6%) patients, three patients were managed by anal dilatation, while one was managed by anoplasty. Mucosal prolapsed was seen in 4 (6.6%) patients, managed by mucosectomy. Anterior displacement of the anus was seen in 1 (1.6%) patient for which revision of surgery was done. Posterior ledge was seen in 1 (1.6%) patient for which anoplasty was done. In the study by Elrouby *et al*., 5% of patients developed anal stenosis, 3.4% had rectal prolapse and 6.7% had anterior anal migration. Constipation was observed in 27% of the patients.[11] In the study by Afzal *et al*., 6.25% of patients developed anal stenosis, 9.37% developed rectal mucosal prolapse and constipation developed in 18.75% of patients.[13] Goyal *et al*., in their study, reported 12.73% (20) patients with late complications.[10] Anal stenosis and perineal excoriation were seen in five patients each, mucosal prolapsed and constipation in three patients each, anterior anal displacement in one patient and posterior ledge in one patient. Zamir and Rasool in their reported anal stenosis and anterior anal migration in 4.28% of patients each.[12]

Conclusion

The single-staged ASARP procedure resulted in satisfactory

Table 4: Post-operative complications, their management and outcome

Early post-operative complications	Number of patients (*n*=9)	Management	Outcome
Wound infection	5	Conservative	Satisfactory
Wound dehiscence	3	Conservative - 1 Stoma - 2	Satisfactory
Retraction of rectum	1	Stoma	Satisfactory
Late post-operative complications	**Number of patients (*n*=24)**	**Management**	**Outcome**
Anal stenosis	4	Anal dilatation - 3 Anoplasty - 1	Satisfactory
Perineal excoriation	6	Conservative	Satisfactory
Mucosal prolapsed	4	Mucosectomy - 3	Satisfactory
Anterior displacement of anus	1	Revision	Satisfactory
Posterior ledge	1	Anoplasty	Satisfactory
Constipation	5	Luxatives/anal dilatation/toilet training	Satisfactory
Faecal impaction	1	Enemas	Satisfactory
Soiling/incontinence	2	Bowel management program	Satisfactory

outcomes. It is an excellent procedure for females with VF and perineal fistula. Appropriate selection (wide fistula), preparation of patient, optimal correction with minimal sphincter damage and needful post-operative care of wound give excellent cosmetic and functional outcomes in terms of continence. It also decreases the burden on treating the surgeon, family and psychological stress on the patients and parents.

Ethical clearance

The study was approved by the ethical committee of the institute.

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Conflicts of interest

There are no conflicts of interest.

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