



## Original Research Article

## Postoperative manometric profile in recto-vestibular fistula and rectourethral fistula: A comparative study

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## ABSTRACT

**Aims:** The recto-urethral (RUF) and recto-vestibular fistula (RVF) are varieties of anorectal malformation (ARM) with distinct clinical behaviour. In this study post-operative clinico-manometric comparison has been done.

**Materials and Methods:** The study was conducted for 2 year period and included post-operative cases of RUF and RVF. Post-operative follow up was done clinically and by anal manometry.

**Statistical analysis used:** Kruskal Wallis test, Mann Whitney U test, and Spearman correlation test were done to find out the statistical significance.

**Results:** A total of 21 patients with RUF and RVF were included. The average basal and squeeze pressure of RVF group was (cm H<sub>2</sub>O) 34.66 ± 13.2 and 89.35 ± 30.8 respectively. These pressures were higher than those of RUF which were 26.74 ± 12.8 and 71.20 ± 42.8 respectively. Rectoanal inhibitory reflex (RAIR) was present in 84.6% cases of RVF in comparison to 62.5% in RUF group. The mean combined (RUF + RVF) basal pressure in RAIR positive group was 32.97 ± 12.2 compared to 24.5 ± 4.6 cm H<sub>2</sub>O in RAIR negative group. The mean combined squeeze pressure in RAIR positive group was 84.34 ± 36.2 compared to 68.83 ± 32.75 cm H<sub>2</sub>O in RAIR negative group.

**Conclusions:** The anal pressures of RVF group were higher than RUF group. Anal pressures also higher in RAIR positive group than the RAIR negative group. Anal pressures and RAIR status may have some role in post-operative outcome in cases of ARM.

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### 1. Introduction

Anorectal malformation (ARM) is a common clinical entity. There are many types of ARM based on the level of the rectal pouch. The most common type of ARM seen in males is rectourethral fistula and in females is recto-vestibular fistula according to Pena's classification. There are only few studies in the literature comparing the clinical and anal manometric followup of these two common varieties of ARM. This study was designed to assess the feasibility and validity of anorectal manometry as a tool to follow up the patients of ARM after Posterior Sagittal Anorectoplasty (PSARP) and correlate with the outcome.

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### 2. Materials and Methods

This study was conducted in the Department of Pediatric Surgery in a medical college in Delhi (India) from 1<sup>st</sup> July 2008 to 31<sup>st</sup> December 2009. Approval was obtained from the ethical committee of the hospital and children were enrolled after receiving informed consent from the parents.

All the children with recto-vestibular fistula and recto-urethral fistula (with rectal pouch below Pubo-coccygeal line) who underwent PSARP were included in the study. All the children were operated by only the authors in the present study. Children with other forms of ARM, children operated outside this institution, patients treated by any other procedure, redo procedures or where the parents did not give consent were excluded from the study.

All the patients were worked up and prepared for definitive procedure. They were advised anal calibrations after 3 weeks. The children were followed up at 3, 6 and 12 months after PSARP. A thorough history and clinical examination was taken. Anal manometry was performed using Albyn Medical Phoenix Plus<sup>®</sup> system. The follow up was performed by a single person for all the children. In manometry, apart from recording the anal pressures (basal and squeeze), rectoanal inhibitory reflex (RAIR) was also recorded in all the cases. Statistical analysis was done using SPSS<sup>®</sup> software version 16. Kruskal Wallis test, Mann Whitney U test, and Spearman correlation test were done to find out the statistical significance.

### 3. Results

A total of 21 patients of recto-vestibular and recto-urethral fistula were studied. Recto-vestibular fistula comprised of 13 children (61.9%) and recto-urethral fistula comprised of 8 children (38.1%). The median age of the patient was 1.5 years (range from 0.25 to 10.5 years). Nine (42.8%) patients were less than one year of age. The male to female ratio was 1:1.6. The incidence of associated congenital anomalies in the recto-urethral fistula group was 50%. However, there were no congenital anomalies seen in the recto-vestibular fistula group.

The anal pressures in the recto-urethral and recto-vestibular fistulas were compared at 3<sup>rd</sup>, 6<sup>th</sup>, and 12<sup>th</sup> month post-surgery. The data is tabulated in Table 1.

In the recto-vestibular fistula group constipation was seen in 5 children (38.4%), incontinence in 1 child (7.6%), and 7 children (53.8%) were asymptomatic. However, in the recto-urethral fistula group none of the children had constipation. Half of the children had incontinence and the rest half were asymptomatic (Table 2).

Rectoanal inhibitory reflex (RAIR) was checked in all cases using anal manometry. RAIR was positive in 11 cases (84.6%) of recto-vestibular fistulas (n = 13). In 5 children (62.5%) with recto-urethral fistula (n = 8), RAIR was positive. The anal pressures were compared with the status of RAIR. The differences in the pressures were compared statistically using Mann Whitney U test. In recto-vestibular fistula, the mean basal pressures in RAIR positive and RAIR negative groups were  $35.94 \pm 12.6$  and  $27.67 \pm 4.6$  cm H<sub>2</sub>O respectively. The difference in the pressure was not statistically significant ( $p > 0.05$ ). The mean squeeze pressures in the aforementioned categories were  $89.96 \pm 31.4$  and  $79 \pm 26.1$  cm H<sub>2</sub>O respectively and the difference in the pressure was not statistically significant ( $p > 0.05$ ). In the recto-urethral fistula, the mean basal pressures in RAIR positive and negative categories were  $30 \pm 11.8$  and  $21.33 \pm 4.6$  cm H<sub>2</sub>O respectively. The difference in the pressure was found out to be statistically not significant ( $p > 0.05$ ). The squeeze pressures in the same categories were  $78.73 \pm 41$  and  $58.67 \pm 39.4$  cm H<sub>2</sub>O respectively and the

difference in the pressure was found out to be statistically not significant ( $p > 0.05$ ). Thus, the mean combined (RUF + RVF) basal pressure in RAIR positive group was  $32.97 \pm 12.2$  compared to  $24.5 \pm 4.6$  cm H<sub>2</sub>O in RAIR negative group. The mean squeeze pressure in RAIR positive group was  $84.34 \pm 36.2$  compared to  $68.83 \pm 32.75$  cm H<sub>2</sub>O in RAIR negative group. The differences of pressures in both the groups were statistically not significant ( $p > 0.05$ ).

### 4. Discussion

The most common type of anorectal malformation in the males is rectourethral fistula and in the females is recto-vestibular fistula. The recto-urethral urethral fistula is the more common variety in the rectourethral fistula group. According to most of the prevalent classification systems like Wingspread classification,<sup>1</sup> Pena's classification and Krickenbeck classification<sup>2</sup> recto-vestibular fistulas in females are classified at par with recto-urethral urethral fistulas in males. In spite of the similar classification, the clinical behaviour of the two types of ARM is quite different and unique. The incidence of constipation is higher in recto-vestibular fistula and other low anomalies (25.68% to 50%) than the rectourethral fistula.<sup>3–6</sup> The normal bowel function rates in recto-vestibular fistulas (65.9% to 98.15%) were also higher than rectourethral fistulas (26.3% to 73.9%).<sup>3,5,7</sup> Conversely, the incidence of incontinence and soiling is more common in rectourethral fistula than recto-vestibular fistula.<sup>3</sup> The reason for this increased association of constipation with certain types of ARM like recto-vestibular fistula, perineal fistula, anterior ectopic anus has been explained on the basis of rectal ectasia.<sup>8</sup> However, there are no studies comparing recto-vestibular fistulas and recto-urethral urethral fistulas. In the present study the incidence of normal bowel function (53.8%) and constipation (38.4%) in recto-vestibular fistula group was higher than the normal bowel function (50%) and constipation (0%) in recto-urethral urethral fistula group.

In the present study, average anal pressures (basal and squeeze pressure) in the recto-vestibular fistula group were higher than the recto-urethral urethral fistula group. The difference in the values of squeeze pressure between the two groups has been shown to be statistically significant. In the literature there are studies which supports the fact that higher anal pressures are associated with better continence.<sup>9,10</sup> It may be extrapolated that even greater pressures than normal may be associated with constipation. However, there have been no studies in support of this assumption.

The role of internal sphincter in anal continence is well known.<sup>11</sup> Rectoanal inhibitory reflex (RAIR) denotes the presence of internal sphincter. In the present study it has been noted that RAIR positivity in recto-vestibular fistulas (84.6%) was more than recto-urethral urethral fistula (62.5%). According to the study by Rintala et al,<sup>12</sup> the

**Table 1:** Anal pressures in both the groups

	Pressure	Mean <sup>3<sup>rd</sup></sup> month (cm H <sub>2</sub> O)	Mean <sup>6<sup>th</sup></sup> month (cm H <sub>2</sub> O)	Mean1 yr (cm H <sub>2</sub> O)	Average (cm H <sub>2</sub> O)
Vestibular fistula (n=13)	Basal	35.77 ± 15.8	34.76 ± 15.2	33.46 ± 12.2	34.66 ± 13.2
	Squeeze	90.84 ± 43.8	84.76 ± 43.8	89.23 ± 33.8	89.35 ± 30.8
Rectobulbar urethral fistula (n=8)	Basal	27.87 ± 8.9	25.35 ± 9.48	27 ± 12	26.74 ± 12.8
	Squeeze	65 ± 51	72 ± 41.4	76.62 ± 37.2	71.20 ± 42.8

**Table 2:** Post-operative outcome

Diagnosis	N	Constipation	Incontinence	Asymptomatic
Vestibular fistula	13	5 (38.4%)	1 (7.6%)	7 (53.8%)
Rectobulbar urethral fistula	8	0	4 (50%)	4 (50%)

RAIR positivity was associated more with children with constipation. On similar lines, the study by Iwai et al<sup>10</sup> found out that RAIR positivity was seen more in children with low ARM. The children with low ARM had more constipation and indirectly therefore RAIR positivity was associated with constipation. The anal pressures in RAIR positive children were more compared to the children with RAIR negative status. However, the difference in pressures was not statistically significant. In contrast to the present study, the study by Sangkhathat et al<sup>13</sup> showed that anal pressures were more in RAIR negative group compared to RAIR positive group. Hence, more studies are required to understand this complex relation between the various symptoms, anal pressures and anorectal reflex.

## 5. Conclusion

We conclude that recto-vestibular fistulas had more incidence of post-operative constipation whereas recto-urethral urethral fistula had more incidence of post-operative incontinence. The anal pressures of recto-vestibular fistula group were more than recto-urethral urethral fistula group. The anal pressures in RAIR positive group was more than RAIR negative group.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.

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