

## Original Research Article

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# STARR surgery in treatment of SRUS: an observational study on clinical outcomes

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## ABSTRACT

**Background:** SRUS is a condition with inadequately learned pathogenesis and usually associated with disorders of pelvic floor. Commonly seen in young adults and impairs quality of life. Because of these facts the management of SRUS is difficult and there is no clear consensus over it.

**Methods:** An observational, prospective study was planned at a single center with purposive sampling. All clinically diagnosed, histologically and endoscopically confirmed SRUS patients treated with STARR surgery and followed for two years. Data collected and analyzed to evaluate the effectiveness and patients satisfaction.

**Results:** Total of 46 patients with median age 47.8 years; of which 27 (58.70%) were females underwent STARR surgery. The average procedure time was 40 minutes, average length of stay was 24 hours and minimum duration of follow up was about 2 years (range 2-4 years). All patients had a pre-surgery history of digitations, which resolved in 91.3% patients post-surgery. There was a significant improvement in the ODS scores at the end of 2 years (82%; P <0.001). Excessive bleeding from staple line (48.57%), staple line dehiscence in 34.28% and staple line stricture (15.71% all males) are complications observed. No recurrence reported at the end of 4 years.

**Conclusions:** Short postoperative length of stay and the short time to return to work after the STARR procedure for management SRUS, minimal manageable complications, no recurrence and patient's satisfaction makes STARR a cost-effective procedure.

**Keywords:** ODS, Recurrence rate, Rectal ulcer, SRUS, STARR surgery

## INTRODUCTION

Solitary rectal ulcer syndrome (SRUS) is an unusual benign condition associated with defecation. It shows extensive range not only in clinical presentation but also in the histological and endoscopic finding. SRUS is a misnomer because only half of patients have a solitary ulcer and in the rest of the patients lesions differ in shape and size, including hyperaemic mucosa to broad-based polypoid lesions.<sup>1,2</sup> It is a disorder of young adults, occurring most commonly in the third decade in men and

fourth decade in women. It, however, has been described in children and in the geriatric population.<sup>3,4</sup> The exact pathogenesis of SRUS is not known and is usually associated with pelvic floor disorders. There is no consensus over its management till date. Surgical treatment like transanal endoscopic microsurgery (TEM) and Laparoscopic resection rectopexy were the treatments of choice for non-healing SRUS.<sup>5</sup> Stapled Trans-Anal Rectal Resection (STARR) developed by Antonio Longo is a novel technique which has been found useful in treatment of anatomical anorectal abnormalities.<sup>6,7</sup>

STARR involves a double stapling technique with the use of a circular stapler which involves full thickness rectal resection, thus correcting the structural abnormalities associated with ODS.<sup>8</sup> The present study was conducted in a single centre with the aim 'To study effectiveness of STARR surgery in treatment of SRUS'. Objectives were to evaluate pre-operative and post-operative symptoms of SRUS and to study Pre and post-operative individual ODS score. To assess intra operative and post-operative events and to study patient's satisfaction at the regular interval.

## METHODS

An observational, prospective study was planned at a single center with purposive sampling. After the approval of institutional ethical committee, patients were enrolled in the study. Patient with clinically diagnosed, histologically and endoscopically confirmed SRUS were included in the study. Informed written consent was obtained from the patients.

During period of two years, total of 46 patients with SRUS were enrolled and treated with STARR surgery. The bowel preparation was done with one or two enemas preoperatively at the morning. Broad spectrum antibiotics as well as deep vein thrombosis prophylaxis done perioperatively. Individual anaesthetist assessment used for preferring General or spinal anaesthesia.

The technique of STARR Surgery developed by Antonio Longo was used in present study. Two circular staplers (PPH03 and PPH01, Ethicon Endo-surgery, USA) were used for circumferential resection (Figure 1).



Figure 1: SRUS before surgery.

A double-stapled circumferential resection of the lower rectum done along with any associated mucosal prolapse, intussusception or rectocele. Complications like excessive bleeding from staple and staple line dehiscence were managed intra operatively by horizontal mucopexy.

Patients were followed for 2 years. Follow up visits were planned on Day 3, Week 2, month 1, month 3, end of

year and end of 2 year. Data collected included age, gender, clinical presentation, past surgical history, preoperative workup, time required for surgery, duration of hospitalization, post-operative complications, and adverse outcomes.



Figure 2: After STARR surgery.

Pre and post-operative ODS score obtained to evaluate symptomatic outcome. Improvement in Longo's ODS score system as well as subjective overall satisfaction of patients were used for evaluation. Healing was assessed with proctoscopy and sigmoidoscopy, when needed. Failure of treatment was defined as no changes in and no lessening of symptoms. Quality of life was assessed by patient assessment of constipation-quality of life questionnaire.<sup>9</sup> Patient follow-up consisted of clinical visits, endoscopic examinations, and/or telephone conversation.

## RESULTS

Out of total 46 patients, 27 (58.70%) patients were female and 19(41.30 %) were from the age group 31 to 45 years (Table 1). The mean age found for SRUS in the study was of 47.81. Constipation and digitations was the most common symptom presented by all the patients followed by rectal bleeding (89.78%), mucous discharge (69.06%), anal pain (37.59%), anemia (11.04%), dysphasia (3.98%) (Table 2). All the patients reported availing medical treatment (with no symptomatic relief) in the past while 11.98% patients reported previous surgical treatment. 11.3% of subjects undergone rectopexy before reporting to the centre (Table 3).

Table 1: Age and sex wise distribution of study subjects.

Age group	Number		Percentage	
	Male	Female	Male	Female
31-45	6	12	13.04	26.08%
46-55	8	6	17.39	13.04
>56	5	9	10.86	19.56
Total	19	27	41.30 %	58.70 %

Mean age = 47.81

**Table 2: Distribution of study subjects as per clinical presentation.**

Clinical Presentation	Number*	Percentage
Rectal bleeding	41	89.78
Constipation	46	100
Mucous discharge	32	69.06
Digitation	46	100
Anal pain	17	37.59
Anemia	5	11.04
Dyschezia	2	3.98

\* More than one clinical presentation reported by patients

**Table 3: Distribution of study subjects as per history of past treatment.**

Past history of treatment	Number	Percentage
Medical treatment	46	100
Surgical	6	11.98
Rectopexy	5	11.57

**Table 5: Pre and Post-operatively individual ODS score items mean values and p value.**

Time period	ODS score items mean values (Mean)									
	Defecation frequency	Straining intensit	Extension of time in defecation	Sensation of incomplete evacuation	Recto/ perineal pain/discomfort	Activity reduction per week	Laxatives	Enemas	Digitation	Longo's total ODS score
Preoperatively	2.46	2.22	2.48	3.15	3.42	2.17	5.26	1.43	5.46	28.05
15 days	2.01	1.43	1.34	2.46	1.97	1.45	2.27	0	0	12.93
1 month	1.57	1.11	1.27	2.14	1.44	1.34	1.42	0	0	10.29
3 months	1.04	0.98	0.91	1.47	1.36	1.09	1.20	0	0	8.05
6 months	0.87	0.84	0.78	1.23	1.11	0.97	1.02	0	0	6.82
1 Year	0.63	0.71	0.58	0.97	0.83	0.84	0.69	0	0	5.25
2 Year	0.51	0.64	0.52	0.76	0.77	0.56	0.56	0	0	4.32

\* Longo's total Score was significantly improved (P <0.001) at the end of 2 years

All 46 subjects underwent STARR surgery under anesthesia. The average surgical procedure time was 40±10 minutes. The average length of stay was 24 hours (48 hours in 4 patients) and resumption to normal activities was on day 5. Minimum duration of follow-up was about 2 years (range 2-4 years).

The most common adverse event observed during operation was excessive bleeding from staple line (48.57%) followed by Staple line dehiscence (34.28%) was due to ulcerated mucosa in most of the patients (Table 4). It was controlled with horizontal mucopexy sutures. Staple line stricture was reported in 15.71% of subjects at around 5 weeks. All the subjects with staple line stricture were male.

All patients had a pre-surgery history of digitations, which was resolved in 42(91.3%) patients post-surgery. There was a significant improvement in the ODS scores at the end of 2 years (82%; P<0.001) (Table 5). In overall patients satisfaction, 65.70% of patients were highly satisfied, 34.3% (Partly contributed by staple line

**Table 4: Distribution of patients as per adverse events observed intra and post operatively.**

Adverse events observed	Number*	Percentage
Excessive bleeding from staple line	34	48.57
Staple line dehiscence	24	34.28
Staple line stricture	11	15.71

\* More than one event observed in one subject

On endoscopy, ulcerative lesions were seen in 86.95% patients. Out of them 45% were solitary 41.95% were multiple lesion. Erythematous mucosa was seen in 1.8% and 5.9% were with rectal polyp. MRI defecography was done in all the patients before surgery which showed internal prolapse in 92%, rectocele in 90%, rectal intussusception in 83% of patients.

Excised specimens were sent for histopathological examination and in all cases, it was consistent with SRUS.

stricture patients) were moderately satisfied. No symptomatic recurrence was reported at the end of 4 years. In present study, at the end of 2 years quality of life improved in 79% patients after surgery.

## DISCUSSION

Solitary rectal ulcer syndrome is an unusual disorder of rectum which can present with rectal bleeding, straining during defecation, and a sense of incomplete evacuation.<sup>10,11</sup> The incidence of solitary rectal ulcer syndrome is uncertain but has been estimated to be 1 in 100,000 individuals per year.<sup>10</sup> In a retrospective study of 80 patients, the median age at diagnosis was 48 years with a range of 14 to 76 years and reported female preponderance.<sup>2,12</sup> Present study showed similar findings, female preponderance is seen in study subjects, with mean age 47.81 years.

Solitary rectal ulcer syndrome is a consequence of chronic straining. Excessive straining can cause a degree of internal prolapse and the prolapse telescopes down into

the anus resulting in pressure necrosis of the mucosa, congestion, edema and ulceration.<sup>13,14</sup> In present study all the patients presented with the history of chronic constipation and digitations. The most common presentation in other series were constipation and bleeding per rectum.<sup>2,12</sup> An unusual presentation of diarrhea rather than constipation, accounting for 15% and 22% of patients in another study was also reported. History of chronic constipation was 20% and 28% in these studies respectively.<sup>15-17</sup>

The diagnosis and management of SRUS is difficult despite of modern medical techniques because of its varied clinical presentation. Drug treatment, such as sulfasalazine, local or systemic corticosteroid and antibiotics have not shown obvious improvement.<sup>18</sup> All the patients in present study had medical treatment with no symptomatic relief before reporting to the centre. Almost one fourth had surgical treatment in past with recurrence. In the event of failure of the medical conservative treatment, the surgical approach for the correction of rectal prolapse should be considered. The optimal surgical procedure is still uncertain, but local excision, rectopexy, diversion, electrocautery have been tried with variable results.<sup>2,11,13</sup> The STARR surgery is relatively non-invasive procedure. It has been found to be an effective treatment for obstructive defecation syndrome caused due to enterocele or intussusception of rectum. The novel procedure aims to correct rectocele, resects internal prolapse, restore anatomy, correct rectal volume, and improve function.<sup>19</sup> None of the available surgical treatments for solitary rectal ulcer associated with rectal conditions are satisfactory due to high recurrence rate. The stapled transanal rectal resection has been demonstrated to successfully cure patients with internal rectal prolapse associated with rectocele or prolapsed hemorrhoids.<sup>20</sup>

In the case study author have performed STARR surgery for local excision, correction of internal mucosal prolapse. Operative time, average duration of stay and post-operative pain is reported similar in other study.<sup>8</sup> A multicentre study done by Stuto et al demonstrated that STARR procedure, is technically simple to perform and able to revert all constipation symptoms; the operative time and hospital stay were short, the postoperative pain and bleeding were minimal, there were no sepsis or postoperative dyspareunia, and patients return early to work.<sup>21</sup> Several studies confirm the safety and efficacy of the STARR procedure for management of ODS.<sup>22-24</sup>

Also, the data collected from this clinical study suggest that 91% of the patients had a satisfactory symptomatic relief from digitations with significantly improved ODS score with the STARR procedure, coupled with a few intraoperative and postoperative complications. The most common intraoperative adverse event was bleeding from the staple line, which occurred in 48.57% of patients, so the anastomotic ring should be meticulously checked and carefully secured with stitches whenever necessary.

Staple line dehiscence (34.28%) was due to ulcerated mucosa in most of the patients. Staple line stricture was reported in male subjects (15.71%) at around 5 weeks which was managed by stricture plasty under anaesthesia. No major complications such as massive rectal hemorrhage and anastomotic line dehiscence reported in study conducted by Hesham M et al.<sup>8</sup>

Incontinence had been reported as an impending postoperative problem of STARR surgery, it may be a complication which is procedure related and caused by transient sphincteric impairment during instrumentation and anal dilatation.<sup>25-27</sup> Similar studies published earlier have mentioned that defecatory urgency was the most common problem reported in the immediate and intermediate recovery periods after STARR surgery.<sup>8,24,28</sup>

Present study results confirmed that the STARR procedure was effective in relieving symptoms of SRUS, improving quality of life and overall patient's satisfaction. Considering the operative time, duration of hospital stays, and resumption of normal activity STARR is cost effective as compared to other surgical procedures available. Ram E et al, in their prospective study concluded that STARR procedure is safe and effective, particularly in young females, due to the absence of complications related to the perineal levatorplasty and better results on postoperative pain, absence of dyspareunia, and better clinical outcome.<sup>29</sup> Similarly studies conducted by Bardek-Amoudi et al and Evan C et al concluded that STARR is more effective in patients with persistent obstructed defecation.<sup>30,31</sup> No recurrence at the end of 4 years was observed in present study while no recurrence at the end of 2 years with minimal complications were reported in study conducted by Palalo B et al.<sup>20</sup> The treatment of solitary rectal ulcer syndrome (SRUS) is notoriously difficult because of its chronicity, complex etiology, clinical presentation and complications. STARR appears to provide a significantly sustained improvement in ODS score and symptomatic relief with minimal, easily manageable complications and none or low recurrence. The short postoperative length of stay and the short time to return to work after the STARR procedure for management SRUS and overall patient's satisfaction makes STARR a cost-effective procedure.

Limitation of the study is that the number of cases included is relatively small and are from a single centre, thus limiting its generalizability; however, at the same time, the study reflected overall effectiveness of STARR surgery in treatment of SRUs with persistent obstructed defecation. Randomized trials with sufficient number of patients are necessary to compare the efficacy of stapled transanal rectal resection with the other surgical treatments of this rare condition.

## CONCLUSION

SRUS is a benign, chronic disorder affecting young adults and usually associated with abnormal defecation or

straining. STARR surgery, an effective treatment option for SRUS, provides sustained improvement in symptoms and patient satisfaction. Result with STARR more promising than all other treatment option available in literature. STARR surgery improves quality of life.

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