SRICTUROPLASTY IN TUBERCULOUS SMALL BOWEL STRICTURES

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Background: This study was conducted at DHQ Hospital Hangu, Babul Madina Medical Centre & Shifa Medical Centre Hangu from March 1995 to February 2001 to evaluate the presentation of tuberculous small bowel strictures and assess the usefulness and applicability of stricturoplasty to these lesions. **Methods:** Ten patients were included in the study in whom the diagnosis of tuberculous small bowel strictures was made on laparotomy and histopathological examination of the tissues taken from the strictures. Heinki/Mikulikz's type stricturoplasty was done in all the cases. The patients were kept on antitubercular drugs and were followed for assessment of outcome. **Results:** Seventy percent of the patients' presented/ operated upon in emergency. Age ranged from twenty to forty years with mean age 31.5 years. Male to female ratio was 6:4. Weight loss and malnutrition were the most common associated features. Terminal ileum alone was involved in 50% of the cases. The strictures were solitary in six and multiple in four cases. The lesions were acute in four and chronic in six patients. Stricturoplasty worked well both in acute and chronic cases. **Conclusion:** Stricturoplasty is safe, simple, and easy procedure particularly suitable at poorly equipped and under staffed district hospitals.

Keywords: Intestinal tuberculosis, Strictures, stricturoplasty.

INTRODUCTION

Intestinal Tuberculosis is a common and major health hazard in Pakistan just like other countries where ignorance, poverty, overcrowding and malnutrition are prevalent. The disease starts either as transverse ulcers in the intestine or hypertrophic mass lesions usually affecting ileocaecal region[1,2]. Later on strictures develop which are usually situated in terminal ileum[3]. These strictures then cause intestinal obstruction, which is usually acute but may be subacute and chronic giving rise to mallabsorption syndrome[4].

Laparotomy is required for diagnosis and is life saving in cases presenting with obstruction or perforation. A number of surgical procedures are available to deal with small bowl strictures, but stricturoplasty is simple, easier and safe operation[5]. It is especially useful for patient with poor general condition. The operation also enables one to deal with multiple lesions without sacrifice of the long segments of the intestine[6].

This study was conducted to determine the presentation of the patient's with small bowl strictures and ascertain the applicability and usefulness of the stricturoplasty at DHQ level hospital.

PATIENTS AND METHODS

This study was conducted at DHQ hospital Hangu, Babul Madina Medical Centre & Shifa Medical Centre Hangu. These hospitals provide health care facilities to the Orakzai and Kurram Agencies in addition to Hangu district. This place is near Afghanistan border and bordering Afghan population also uses these facilities. The duration of study was six years from March 1995 to February 2001. Ten patients included in this study fulfilled the following criteria of paustian[2].

1- Laparotomy revealed bowel stricture(s) with or without mesenteric lymphadenopathy/peritoneal tubercles.

2- Histopathology of the stricture/Mesenteric lymph nodes or peritoneal tubercles revealed caseating granulomata.

The age, sex and the nationality of the patients were recorded. Their detailed history was taken with special reference to their abdominal pain and altered bowel habits and concomitant pulmonary tuberculosis. Proper physical examination was performed. Their nutritional status was assessed clinically by measuring body mass index (BMI) & mid arm muscles circumference (MAMC).

Peripheral lymphadenopathy was looked for. Radiographs of the abdomen and chest were taken. ESR was measured in al the patients in addition to routine baseline investigations. The ultrasound scan of the abdomen was obtained only in two cases. The patients were resuscitated when necessary before operation.

The operative findings were recorded regarding the site and number of strictures and associated findings, i.e., tubercles on peritoneal surfaces, mesenteric lymphadenopathy and thickening of mesentery. Stricturoplasty was performed in all cases. Bowel was opened longitudinally along the anti-mesenteric border between two loosely applied stay sutures at the centre. The incision extended 1–2 Cm in healthy non-strictured bowel on either side. The stay sutures were then pulled apart converting the linear incision into a diamond shaped defect. Biopsy from the margins of the incision including the strictured part was taken and sent for histopathology. Mesenteric lymph nodes and peritoneal tubercles when present were also sent for histopathology. Closure was then started from one stay suture and continued transversely to the other one. The repair was done in two layers, inner full thickness with 2/0 catgut and outer seromuscular with 2/0 silk. In patients with multiple strictures, similar procedure was done at more than one site.

Patients were kept on nasogastric suction and intravenous fluids for six to seven days. Antibiotics were used in all cases and the regimen was Metronidazol, Ampicillin and Streptomycin.

The patients were monitored for post operative complications. On sixth to seventh day the patients were allowed to take orally and full anti- tubercular regimen was started. This was Isoniazid (INH), Rifampicine, Ethambutol and Pyrazinamide. After two months Pyrazinamide was excluded from the regimen and the other three drugs were continued for a further four months. Regular monthly follow-up was possible in nine cases. On every visit the patients were

clinically examined. Their proper drug intake was ensured and any drug complications searched for. One patient left for Afghanistan but his relatives conveyed his well-being and regular intake of drugs. He was only re-examined after 11 months when he came for advice regarding discontinuation of drugs.

RESULTS

Seven patients presented with acute intestinal obstruction and operated upon in emergency after resuscitation. In 2 patients diagnostic/exploratory laparotomy was performed for recurrent abdominal pain and altered bowel habits. One patient presented with pain in right lower quadrant of abdomen and operated upon on the presumptive diagnosis of acute appendicitis. Table-1 summarizes the preoperative presentation of these cases.

All the patients were between 20 to 40 years of age with mean age of 31.5 years. Male to female ratio was 6:4. Five patients were Afghan refugees. Diagnosis of intestinal tuberculosis was established only after operation.

Table-1: Presentation of tuberculous bowel strictures in 10 cases

Presentation	No. of Patients	%
Acute intestinal Obstruction	7	70%
Acute appendicitis	1	10%
Chronic abdominal pain with altered bowel habits	2	20%

Concomitant cervical lymphadenopathy was noted in two patients. X-ray chest was suggestive of pulmonary tuberculosis in one patient. High ESR and malnutrition were observed in five cases each. Table-2 illustrates these concomitant features.

Table-2: Concomitant clinical features in 10 patients of intestinal tuberculosis.

No Concomitant features	No. of Patients	%
Malnutrition and wt. loss	5	50%
High ESR	5	50%
Suggestive chest X-Ray	1	10%
Cervical lymphadenopathy	2	20%

Strictures in small bowel were solitary in six cases, All the solitary strictures caused acute intestinal obstruction. Multiple small bowel strictures were found in remaining four cases. The number and sites of strictures are shown in Table-3.

Table-3: Location of strictures in 10 cases of intestinal tuberculosis

No. and site of strictures	No. of Cases	%
Single stricture in terminal ileum	5	50%
Single stricture in proximal ileum	1	10%
Multiple strictures in ileum	2	20%
Multiple strictures throughout the small bowel	2	20%

In one patient caecum was scarred and ileocaecal angle was deformed. In another patient there was mass formation in ileocaecal region with tubercles on peritoneal surfaces. Multiple peritoneal tubercles were also seen in two other cases. Mesentery of the small bowel particularly

of the terminal ileum was thickened in seven cases. Mesenteric lymph nodes were enlarged in three cases. Strictures in four cases were oedematous, reddish, and broad while in remaining six cases they were thin white and well demarcated. Table-4 shows these morphological features.

Table-4: Morphology of intestinal tuberculosis in 10 patients.

Pathological changes	No. of Cases	%
Acute strictures	4	40%
Chronic strictures	6	60%
Ileocaecal scarring	1	10%
Ileocaecal mass	1	10%
Thickened mesentery	7	70%
Mesenteric lymphadenopathy	3	30%

Six patients underwent single stricturoplasty while in four patients the procedure was done in more than one site. Mean hospital stay was nine days ranging from seven to sixteen days. Significant wound infection occurred in four patients. Three patients had postoperative chest complications. No patient died in the study.

DISCUSSION

Tuberculosis is the common cause of small bowel strictures in our part of the world[4,5,6]. Other causes of bowel strictures include Crohn's disease[7,8], irradiation[9], drugs[10] and mesenteric vasculopathy[11] but are rare in this subcontinent[12]. The operation of 'stricturoplasty' for tuberculous strictures of GIT was first reported in 1977 by Katarya[13] from Chandigarh (India). The operation is similar to the Hienki 1886 and Mikulikz1888 pyloroplasty for pyloric stenosis described more then a century ago[14]. Surgeons knew the bowel strictures even before this, but the method of Heinki/Mikulikz was not applied to these lesions distal to pylorus, or at least not reported. Strictures were sometimes bypassed and sometime resected. Katarya's article revolutionized the treatment of small bowel strictures. His good results attracted the surgeons all over the world. Pujari[6], Khan C[5], Mohayuddin QK[15] and Dandapat MC[12] had reported their series from Indo-Pak-Subcontinent. The surgeons from the western world adopted this operation for the Crohn's disease prevalent there and found the results even more encouraging. They have made further modification in the method. Boufo-AJ, *et al*[16] has reported stapled stricturoplasty in 1995 Endoscopic balloon dilatation has also been reported by Ball-WS *et al*[17], Fregonese D *et al*[18] and William & Palmer[19].

Intestinal tuberculosis like tuberculosis elsewhere in the body affects young peoples at the peak of their reproductive life. This fact has serious impact on national economy and production as sick and ill individuals replace a working and productive class of community. All the patients in our study were between 20 to 40 years of age. This is in accordance with the results of Anand & Pathak[20], Ohri and Agrawal[21], Das & Shukla[22], Khan C[5],Kirsten D[23] and Bilbao-Garey J[24].

Males were more commonly affected than females in our study. This is in contrast to the observation of Anand SS[25], Ohri & Agrawal[21], who reported the male to female ratio of 1:3.16 and 1:4 in their series. Bilbao Garey J in 1992 has reported the equal distribution of this disease in both sexes[24]. The male prevalence in our study is probably due to male dominant tribal

society where females are restricted to their homes and not brought to the hospitals for treatment at the early stage of their disease.

Eight out of 10 patients in present study presented in emergency as acute abdomen. This is again in contrast to the observation of Bhansali[3] and Palmer *et al*[26] where acute presentation of intestinal tuberculosis was reported in 46% and 40% of their cases respectively. This is because of the poverty, ignorance and quackery in this tribal belt. Patients ignore their initial symptoms and treat them by traditional remedies till some catastrophe forces them to consult a doctor.

Weight loss and malnutrition was the most common associated feature in our study and was observed 5 out of 10 cases. Bhansali[3] has reported weight loss and diarrhoea in 52 out of her 300 cases. Anand[25], Ohri&Agrawal[21], Lewis and Kolawole[27], Lewis and Aboyo[28], Parkash[29], Mukarjee & Singal[30] have reported the incidence of weight loss in 76%, 45%, 100%, 90%, 89% and 80% respectively in their cases of intestinal tuberculosis. This frequent weight loss in intestinal tuberculosis is because of stasis in the bowel due to strictures. Stasis causes bacterial overgrowth in the small bowel lumen, which reduces the conjugated bile acid concentration below critical micellar concentration so that fats are not absorbed properly. Inappropriate bacteria in the small bowel also ferment the carbohydrates to derive energy. The bacteria also compete with the host for available protein substrates metabolizing them to ammonia and fatty acids, which are unable to contribute towards protein anabolism. Thus bacterial growth in the small bowel causes malabsorption of fats, proteins and carbohydrates, which is then manifested clinically with weight loss and diarrhoea[31].

Suggestive chest X-rays and peripheral lymphadenopathy was seen in one and two patients respectively. Similar findings have also been observed by many other authors.[32].

Terminal ileum was the most commonly involved bowl segment in our study. This is similar to the observation of Das&Shukla[22], Anand SS[25] and Abrams and Holden[1]. This frequent involvement of terminal ileum is due to relative physiological stasis, rapid absorption rate and abundance of lymphoid tissue in this area[1,22].

CONCLUSION

Tuberculous strictures of small bowel are common cause of intestinal obstruction in our community. Patients usually present late in the course of their disease and most often some acute catastrophe brings them to the surgeon. Clinical features are usually non-specific, vague, and diverse and accurate diagnosis is almost always established at operation. Stricturoplasty is a safe, simple and easy operation, particularly useful at small peripheral hospitals with limited staff and resources.

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