

Endoscopic diagnosis, management and outcome of gastroduodenal tuberculosis

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Abstract Current guidelines for gastroduodenal tuberculosis suggest that surgery in conjunction with anti-tubercular therapy (ATT) is the primary therapy. We determined the efficacy of endoscopic balloon dilatation along with ATT as the primary treatment for this condition. Patients with gastric outlet obstruction at endoscopy seen over a two-year period underwent multiple biopsies from the involved area. Those in whom mucosal biopsy revealed non-specific inflammation, underwent endoscopic mucosal resection (EMR). Patients showing granulomatous inflammation with/without acid-fast bacilli (AFB) underwent endoscopic balloon dilatation under fluoroscopic guidance along with ATT. End point of dilatation was taken as dilatation with 18 mm balloon. The time taken to resume normal diet post endotherapy was determined. Thirteen patients were diagnosed to have gastroduodenal tuberculosis. Granulomatous inflammation with or without demonstration of AFB was documented in 92 % of the patients by endoscopic biopsy and EMR. Endoscopic balloon dilatation of the strictures

was successful in 11/12 patients (92 %); these patients could resume their normal diet at a median of 11 days (range 7–60) post-dilatation. Retroperitoneal perforation in 1 patient was managed conservatively. Endoscopic therapy in combination with ATT is recommended as the first line therapy for gastroduodenal tuberculosis. Surgical intervention is reserved for the minority in whom endoscopic therapy fails.

Keywords Anti-tubercular therapy · Balloon dilatation · Endoscopic mucosal resection · Gastric outlet obstruction · Gastroduodenal tuberculosis

Introduction

Gastrointestinal (GI) tract is the sixth most frequent site of extra-pulmonary tuberculosis. Gastric and duodenal tuberculosis each account for only 1 % of cases of abdominal tuberculosis, even in countries where the disease is endemic [1, 2]. Typically the disease manifests with features of gastric outlet obstruction; rarely it may mimic malignancy or present with GI bleed [3]. Traditionally, surgery has been recommended as the treatment of choice as it achieves the dual purpose of establishing the diagnosis as well as alleviating the obstruction. Previous data mostly from India have suggested the inability of endoscopic techniques to make the correct diagnosis in majority of cases [3–6]. We prospectively studied 13 patients with gastroduodenal tuberculosis over the last 2 years with an attempt to obtain a definitive histological diagnosis at endoscopy and evaluate the efficacy of graded endoscopic balloon dilatation in combination with anti-tubercular therapy (ATT).

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Methods

Patients suspected to have gastric outlet obstruction on the basis of clinical history and physical examination underwent upper gastrointestinal endoscopy after an overnight fast; a nasogastric tube had been placed earlier to empty the stomach. Multiple biopsies (6–8 pieces) from the area of narrowing were taken. Blood and radiological investigations including chest X-ray (CXR), plain X-ray abdomen, abdominal ultrasound, barium studies and CT scan of the upper abdomen were done to elucidate the cause of gastric outlet obstruction. If histology of duodenal biopsy showed non-specific chronic inflammation, an endoscopic mucosal resection (EMR) was done from a raised/nodular lesion using crescent snare (Olympus, Japan) through a plastic cap attached to the distal end of the endoscope after injection of 3–5 mL of saline to further elevate the lesion. The diagnosis of gastroduodenal tuberculosis was considered if the duodenal biopsy or EMR specimen showed features of caseating granuloma with or without demonstration of AFB. Patients were then started on anti-tubercular drug regimen containing streptomycin, isoniazid, rifampicin and pyrazinamide in the recommended dosage as per patient's body weight. Liquid preparations of isoniazid and rifampicin were used initially to prevent the entire drug being rendered ineffective due to vomiting; the tablet/capsule formulations were started after the vomiting subsided. ATT was administered for 6 months; in patients with frequent and prolonged vomiting, it was administered for a further 3 months. Compliance to ATT was assessed on each out-patient visit. Body mass index (BMI) was recorded at baseline and then repeated at an interval of 3 months.

Balloon dilatation of the pyloroduodenal strictures was done using over-the-wire through-the-scope (TTS) balloons (Titan, Wilson-Cook, USA). A (0.035) guidewire with hydrophilic tip (Jagwire, Boston-Scientific, USA) was passed under fluoroscopic guidance into the third part of the duodenum; subsequently graded dilatation was done starting with a 12-mm balloon and gradually progressing over 2–3 sessions (done at intervals of 1–2 weeks) until an 18-mm diameter balloon could be fully inflated. This was followed by the passage of an adult videogastroscope across the stricture which was considered as an arbitrary end-point for dilatation. Dilatation was repeated if the patient complained of recurrence of vomiting following the last successful dilatation. The time taken to resume a normal diet post-endothrapy was determined on subsequent follow up. Patients with tight strictures in whom dilatation could not be done were subjected to surgery. Serial monitoring of liver biochemistry was done to detect drug-induced liver injury during the course of ATT. The details of the study were explained and a written informed consent taken from each study subject.

Statistical methods Analysis was performed using SPSS software (version 15). Data were expressed as median and range. Paired data were compared using Wilcoxon Sign Rank test. *P*-value <0.05 was considered significant.

Results

Gastric outlet obstruction was diagnosed in 13 cases over a two-year period from January 2009 to December 2010. The median age of patients was 27 years (range 11–45). The dominant symptom in all the patients was recurrent vomiting for median duration of 2.5 months (range 0.5–36), and weight loss median 10 kg (range 6–15). Constitutional symptoms like fever, anorexia and malaise were present in five patients. Four patients had earlier received treatment with ATT for pleural and/or pulmonary tuberculosis in the past. Median BMI at baseline was 16 (range 12.2–17.3) kg/m². At endoscopy all but one patient had narrowing with ulceration and nodularity in the pyloroduodenal area (*n*=10) or in the second part of the duodenum (*n*=4) (Fig. 1). Two patients had multifocal disease involving pyloroduodenal area and second part of the duodenum. An antral hypertrophic nodular mass without involvement of the pyloric channel was seen in one patient. Abdominal CT imaging showed thickened antroduodenal area (Fig. 2) with or without significant lymphadenopathy in all 7 patients where it was performed. Barium studies of the upper GI tract delineated the location, the length and the calibre of the strictures in all 11 patients were performed. In selected patients, serial barium studies showed progressive resolution of the stricture (Fig. 3) while the patients were on ATT. EMR was done in 4 patients and presence of granulomatous pathology was documented in 3 of the four with the additional finding of acid-fast bacilli (AFB) in one patient. The only patient with negative EMR was rebiopsied and that biopsy showed granulomatous pathology. Histological demonstration of granulomas (Fig. 4) and AFB either on pinch biopsy or EMR specimens was achieved in 12 (92 %) of the 13 cases. EMR was not associated

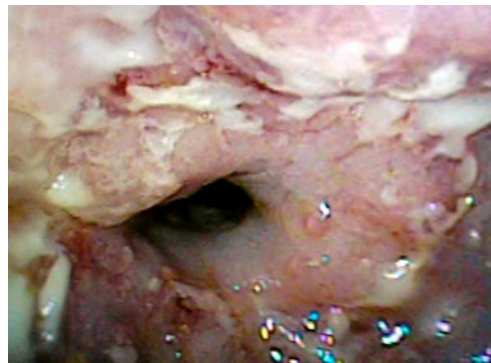


Fig. 1 Magnified view of endoscopic appearance of a stricture with extensive circumferential ulceration in the second part of the duodenum

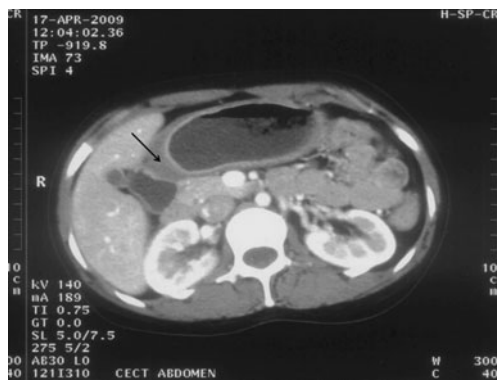


Fig. 2 CE CT of the abdomen showing thickening of the antroduodenal area (*arrow*)

with any immediate or delayed complication. Balloon dilatation was successfully performed in 11 of the 12 patients using over the wire technique under fluoroscopic guidance. A median of 4 (range 1–6) sessions were required to achieve the endpoint of dilatation with 18 mm balloon followed by successful passage of videogastroscope with an outer diameter of 11 mm. Apart from one retroperitoneal perforation, balloon dilatation was uneventful in 10 patients; the patient with the retroperitoneal perforation was subsequently dilated after 2 weeks of conservative management. No recurrence of vomiting was seen in any patient after 8 weeks of therapy with ATT and balloon dilatation. The median time taken to resume the normal diet was 11 days (range 7–60 days). Median increase in BMI at 3 months post therapy vis a vis the baseline value was 4.5 (range 1.1–6.5) kg/m² (*p*=0.02).

One patient was referred for surgery as endotherapy was unsuccessful; the diagnosis of tuberculosis was subsequently confirmed from biopsy taken at surgery. Compliance to the ATT for 6–9 months was universal. No patient developed features of drug induced liver injury during the course of the ATT.

Discussion

Gastroduodenal tuberculosis is an uncommon disease reported mainly from areas of high endemicity for tuberculosis [3, 4,

Fig. 3 Serial barium studies showing progressive resolution of the antral stricture **a**) initial film showing antral stricture **b**) 9 months after initiating combination therapy **c**) after 12 months of treatment

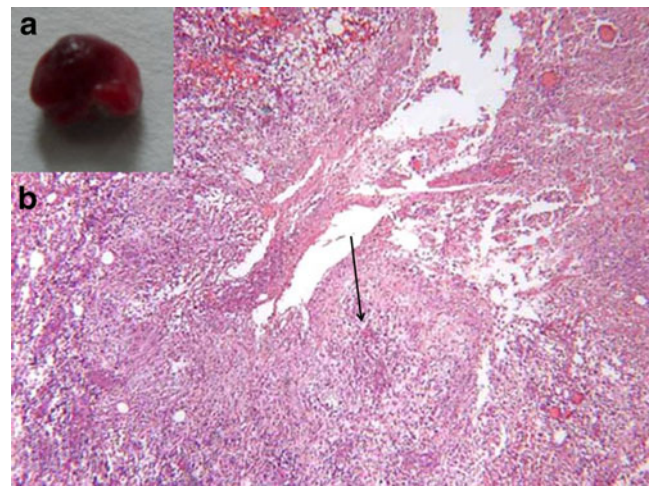
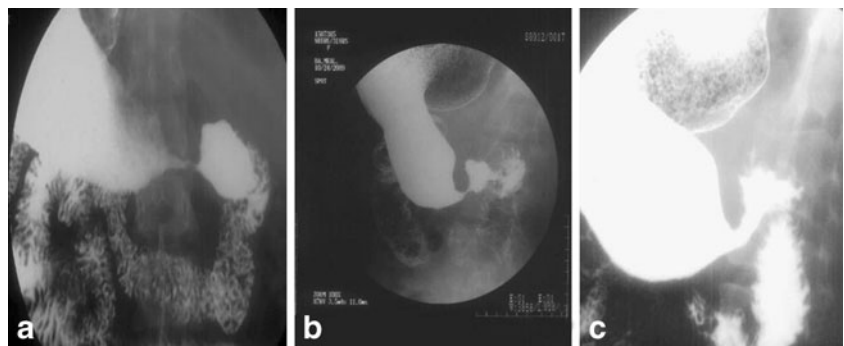


Fig. 4 **a** Gross specimen obtained by endoscopic mucosal resection. **b** Histopathological specimen (H&E) of duodenal tissue showing submucosal granuloma (*arrow*)

6–8] although anecdotal reports have come from all over the world [9–11]. The commonest site of involvement is the pyloro-duodenal area followed by the second part of the duodenum. As emphasized by several authors the clinical suspicion of gastroduodenal tuberculosis is high in young patients living in endemic areas who present with features of gastric outlet obstruction [3, 4, 8]. Most patients with this disease have traditionally been managed by a surgical bypass to relieve the obstruction. A retrospective study from our hospital, published as recently as 2003 concluded that gastroduodenal obstruction was seldom diagnosed preoperatively and surgical intervention helped not only in relieving the obstruction but also in confirming the diagnosis [4]. Two previous studies from India gave the identical message of low yield of endoscopic biopsy and the need for surgical intervention [3, 6]. Our study has conclusively shown that using a combination of endoscopic pinch biopsy along with endoscopic mucosal resection of the hypertrophic nodules, the histological yield can be significantly increased from the dismal rates of 3 % to 29 % reported earlier [3, 4, 6] to as high as 92 %. We were also able to document AFB positivity in 2 of the 13 patients which has rarely been documented in non-surgical biopsies [2]. Importantly our results suggest a

paradigm shift in the treatment of this disease from surgical intervention to endoscopic therapy. Only one of 13 (7 %) patients in our study was subjected to surgery after repeated attempts failed to negotiate the guide wire across the stricture. The fact that none of our patients had any major complications further highlights the safety profile of endoscopic therapy.

The utilization of EMR for tissue diagnosis of gastrointestinal tuberculosis is unique to our study. We hypothesized that histological yield of granuloma/AFB could be increased by increasing the quantum of tissue. Hence our diagnostic approach was to perform multiple pinch biopsies from the abnormal area. In case the histology showed only non-specific inflammation, EMR of the most prominent nodule was done. With this approach we were able to document AFB and granulomatous inflammation in 1 and three patients, respectively. More data are needed to validate our observations on the utility and safety of performing EMR for this diagnostic use in gastroduodenal tuberculosis. In those patients where a thickened antrum is documented on CT (Fig. 2), EMR can safely be done without the risk of perforation.

In the South Asian or Indian context, where tuberculosis is statistically much more common than Crohn's disease, an empirical trial for 4–6 weeks with ATT for luminal strictures is the usual practice. The fact that all the 10 patients in our study who had granulomas sans demonstration of AFB responded clinically to the combined therapy validates this therapeutic strategy. Pulimood et al. [12] have suggested that it is however possible to distinguish granulomas seen in tuberculosis vis a vis Crohn's disease by the larger size (mean 193 μ) and the presence of caseation in the former.

Balloon dilatation for tubercular duodenal strictures was first described by Vij et al. [13] in 1992 as a single case report wherein a single session of balloon dilatation combined with ATT resulted in a favorable outcome in a patient with duodenal stricture. A passing reference of the efficacy of this therapy in 2 patients with tuberculosis was made in a recent publication [14]. In our experience most patients with pyloric or duodenal strictures require multiple (median 4) sessions of balloon dilatation. This may be due to the recoil effect of the extensive circumferential fibrosis seen in this condition. A recent study from India has shown that a mean number of 2.2 sessions were required for effective balloon dilatation of benign gastric outlet obstruction [14]. The efficacy of balloon dilatation is further validated by the fact that most patients in our report were able to resume their regular diet within a median period of 11 days (range 7–60 days). As a consequence of the adequate nutrition and the anti-tubercular therapy there was rapid weight gain manifesting as a median increase of 4.5 kg/m² in the BMI over the first 3 months.

ATT is the mainstay of treatment with gastroduodenal TB. As per the standard guidelines of treatment of tuberculosis four drugs should be used for a minimum of 2 months, followed by two drugs (isoniazid and rifampicin) for the next

4 months. It is advisable to use streptomycin in the initial phase as this is the only drug given parenterally and would be absorbed even in the wake of recurrent vomiting. We have intentionally used syrup preparations of both isoniazid and rifampicin in our initial drug regimen as they are less likely to be vomited out in-toto vis a vis capsules or tablets. Once the patient resumed a normal diet the liquid preparations were replaced by their tablet or capsule formulations. None of our patients had any untoward effect of the ATT.

In conclusion, it is possible to achieve the correct histological diagnosis of gastroduodenal tuberculosis using a combination of endoscopic biopsies and EMR in more than 90 % of the patients. Balloon dilatation combined with ATT is associated with rapid alleviation of symptoms within a few weeks in the majority of these patients. Surgical intervention is rarely needed and should be reserved only in those where balloon dilatation is not feasible.

Conflict of interest None

Source of support None

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