

Histomorphological Spectrum of Gastrointestinal Tuberculosis

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Objective: To study histomorphologic changes in Gastrointestinal Tuberculosis (GITB) and to determine the frequency of Primary versus Secondary TB. To determine the frequency of different group of lymphnodes involvement.

Methods: A study of 40 resected and autopsy specimens over 6 years period was undertaken in the Department of Pathology. Blocks from formaline fixed specimens of involved bowel and lymph nodes were processed, embedded, cut (5-6 micron thick) and stained with Haematoxylin -Eosin for light microscopy.

Results: Primary intestinal tuberculosis was rare at autopsy (only 2/20 cases). Majority of cases were secondary to pulmonary involvement (17/20 cases). Ulcerative type (77.5%) was the commonest morphologic type with predominant involvement of ileum. Appendix (5%) and Stomach (2.5%) were rarely involved. At autopsy, mesenteric lymphadenopathy (80%) was noted to be the commonest, followed by tracheo-bronchial group of lymph nodes (27.5%). Retroperitoneal lymph nodes were rarely involved.

Conclusion: Incidence of Gastrointestinal Tuberculosis (GITB) at autopsy was found to be 0.68 %. Overall, secondary form of GITB was the commonest. Associated TB in the mesenteric lymph nodes was frequent.

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Tuberculosis has been known to mankind since ancient times. Gastrointestinal tuberculosis (GITB) is still one of the major health problems that a clinician encounters

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in routine practice^{1,2}. Though it is a common disease in tropics and developing countries, its exact prevalence in our population and at postmortem has not been evaluated³. Western studies deal primarily with antemortem cases of gastrointestinal tuberculosis^{7,9}. To study histomorphologic changes in Gastrointestinal Tuberculosis (GITB) and to determine the frequency of Primary versus Secondary TB. To determine the frequency of different group of lymph nodes involvement.

METHODS

Forty histologically proven patients (20 consecutive autopsy and 20 resected specimens) of GITB were included in this study. The criteria for diagnoses were as follows:

- (a) Histologic demonstration of characteristic epithelioid granulomas with or without caseation either in the bowel or regional lymph nodes.
- (b) Detection of acid fast bacilli (AFB) in Ziehl-Neelson stained sections and or their isolation upon culture from unfixed tissues.

Brief clinical details of each patient were obtained from central record section. Special attention was paid to the symptoms pertaining to gastro-intestinal tract and lungs. A history of prior anti-tubercular therapy was recorded. Macroscopically, the following were recorded: site of resection, length of specimen, serosal surface for any tubercles, site of lesion with or without luminal narrowing, appearance of mucosa around or adjacent to the ulceration or narrowing, any evidence of polypoidal mucosa, bowel thickening due to fibrosis and mesenteric fat thickness. Thus, the lesions were classified into three types: (a) ulcerative, (b) ulcero-hypertrophic, and (c) hypertrophic. Various groups of lymph nodes mainly in autopsy specimens were examined in respect to their number, size, isolated or matted and presence or absence of gross caseation. Pleural and cut surface of each lung at autopsy was carefully examined to detect any tuberculous foci such as miliary tubercles, solid or caseous nodules, cavitory and bronchopneumonia. Swabs or tissues from caseous material from unfixed specimens of bowel, lymphnodes and lungs were sent for Mycobacterium tuberculosis culture.

Microscopically, the following features were recorded: ulceration and pyloric gland metaplasia, epithelioid cells granulomas with lymphocytic collar at the periphery, typical Langhan's and foreign body giant cells reaction, caseation necrosis and fibrosis in the muscularis propria. The extent of the granulomatous inflammation, for example, limited to the mucosa, submucosa, muscularis propria or the serosa was recorded. Vascular lesions such as endarteritis obliterans or vasculitis were looked for. Similarly lymph node and lung sections were studied for the presence or absence of granulomas with or without caseation necrosis and accompanying fibrosis.

RESULTS

Age ranged from 2 to 60 years (mean 28 years), 22 males and 18 females (male to female ratio being 1.2:1). Clinical details were available in all except 4 cases. The most frequent symptom was fever in 26 patients (72.2%) followed by abdominal pain in 24 (66.6%), vomiting in 11 (30.5%), palpable mass in the right iliac fossa in nine (25%) and diarrhoea in eight (22.2%). Duration of symptoms ranged from 3 days to 7 years. Nine patients showed acute ulcerative form with solitary and multiple perforations and features of generalized peritonitis. In three cases, perforations were noted at autopsy. Fifteen patients had received full course of antituberculous therapy.

Figure 1. Ulcerative type of TB with typical transverse ulcer.

(Table 1) The ileum was the most frequent site of main pathology in 24 patients (60%). Isolated bowel involvement was present in 26 patients, out of which ileum was affected in 13 (32.5%) as ulcerative form, ileo-caecal junction in 10 (25%) and colon alone in three patients (7.5%). Ulcerative and ulcero-hypertrophic lesions in the ileo-caecal region were seen in six patients each. Appendix was affected by tuberculosis in two and colon in 14 (35%). Isolated colonic lesions were seen in only three patients (7.5%), one of them revealed typical hypertrophic form with marked thickening of bowel wall due to fibrosis, the other two showed ulcerative and ulcero-hypertrophic forms respectively.

Table 1. Site of involvement (N = 40)

Site of lesion	Number of patient in combination	Number of isolated bowel lesion
Stomach	1 (2.5)	-
Ileum	24 (60)	13 (32.5)
Ileocaecal junction	12 (30)	10 (25)
Appendix	2 (5)	-
Colon	14 (35)	3 (7.5)

Figures in parenthesis indicate percentage

Lymph nodes were involved in 97.5% of patients. Characteristic matted lymph nodes and gross caseation were observed in 18 (45 %) and 14 (35%) specimens respectively. Table 2 shows macroscopically three lesions. Ulcerative type, the commonest (31 patients) was found frequently affecting the ileum (23 patients). In this variety, the mucosal ulceration is dominant with mild to moderate induration. The ulcers were often multiple with variable lengths of uninvolved mucosa in between. These ulcers were usually transverse (Fig.1). The ulcers being relatively superficial and the floor was often covered with a necrotic slough. In one patient due to undermined margins, pseudopolypi was found. In established lesion 2 to 3cms long annular stricture involving the entire circumference

with narrowing of lumen and peritoneal surface studded with small tubercles was found. Ulcero-hypertrophic type was found involving mainly ileocecal region in eight patients (20%). The affected segment showed marked thickening of bowel wall with adhesions involving mesenteric fat and regional lymph nodes (Fig.2). Pure hypertrophic form of tuberculosis was encountered in one case. Besides small superficial ulcers, the wall showed marked thickening due to fibrosis. Stomach was involved in the form of an ulcer in one patient at autopsy.

Figure 2. Ulcerohypertrophic type of TB of ileo-caecum with marked thickening of bowel wall.

Table 2. Types of Macroscopic Lesions (n = 40)

Type of lesion	Number of patient
Ulcerative	31 (77.5)
Ulcero-hypertrophic	8 (20)
Hypertrophic	1 (2.5)

Figures in parenthesis indicate percentage

Microscopic features are summarized in Table 3. Discrete and confluent epithelioid cell granulomas (Fig. 3, 4) were seen in 40 patients (100%), whereas caseation necrosis was noted in 32 (80%). Acid fast bacilli (AFB) were slightly less commonly detected in the bowel sections in 30 cases (75%) compared to lymph nodes 34 cases (85%). Pyloric gland metaplasia was noted in only two patients. The endarteritis obliterans was found in one and inflammatory polypi was found in another patient. Mycobacterium tuberculosis was grown in all five cultures undertaken, of which one was atypical. In the remaining, cultures could not be done, because tuberculosis was either not suspected or the specimens were already formaline fixed. Lungs were histologically affected by tuberculosis in 17 of the 20 autopsy cases.

Table 3. Types of Microscopic Lesions (n = 40)

Type of lesion	Bowel Number of patients	Lymph node Number of patients
Caseation	32 (80)	29 (51.3)
Epithelioid cell granuloma	40 (100)	26 (65)
Langhans' giant cell reaction	22 (55)	11 (27.5)
Foreign body giant cell reaction	7 (17.5)	5 (12.5)
Fibrosis	9 (22.5)	-
AFB positivity	30 (75)	34 (85)

Figures in parenthesis indicate percentage

*Figure 3. Micrograph of Tuberculous ulcer with submucosal granulomas.
Haematoxylin & Eosin x 40.*

*Figure 4. Characteristic epithelioid granuloma with a Langhan's giant cell.
Haematoxylin & Eosin x 160.*

DISCUSSION

In spite of good progress in treatment and prophylaxis, tuberculosis still poses a major health problem globally¹⁻³. The precise incidence of abdominal tuberculosis is not known due to lack of random samples of population studied. The reported incidence varies from 0.02- 5.1% in various autopsy series⁴. In this study, 20 patients of gastrointestinal tuberculosis were found among 2936 autopsies, (a frequency of 0.68%). The remaining 20 patients comprised of histologically confirmed resected specimens of GITB. The incidence of intestinal TB was the highest in second and third decades of life in the present study, which is similar to other studies^{1,5}. There was a slight male predominance over female. The reported female to male ratio varies from 3:1 to 4:1 in different studies on isolated bowel TB^{5,6,10}.

Intestinal TB can be primary or secondary⁸. It may or may not be associated with Pulmonary TB. The present study revealed associated lung involvement in 17 out of 20 patients (85%) among the autopsy group. The incidence of secondary form of Intestinal TB in patients of Pulmonary TB varies from 1 to 90 %^{3,7}. Such wide variation is possibly explained by the difference in the severity of pulmonary lesions and the effectiveness of antitubercular treatment. Among 20 autopsied patients in the present study, only two patients were classified as primary intestinal TB.

Abdominal pain was the main presenting symptom in 24 patients (66%), which was substantiated by other workers^{1,6,9}. Vomiting suggestive of small obstruction was noted in 11 patients (20.5%), fever with evening rise, typical of tubercular toxæmia, was present in 26 patients (72.2%). Only eight patients (22.2%) complained of diarrhea. Hoon et al reported abdominal pain in 87.9%, vomiting in 32.2% and fever in one third of patients⁹. Palpable caecal mass was noted in 48% of patients by Anand and 65% of

patients by Paustian and Bockus^{10,11}. In the present study, caecal mass in the right iliac fossa was found in 25% of our patients.

Acute ulcerative form of TB with perforation was found in nine (six resected and three autopsy specimens). The incidence of perforation in GITB enteritis varies from 1 to 10%^{15,16}.

Intestinal TB may involve any region of the gastrointestinal tract. In the present study, ileum and ileocecal combined were the most frequently affected, followed by colon, ileocecal region, appendix and stomach which is similar to other series^{10,14}. Isolated colonic TB is relatively uncommon in India¹². In this study three patients (7.5%) were found to have colonic TB. Tuberculosis confined to the appendix is rare, although tubercular involvement in the presence of TB elsewhere in the body (Lungs or GIT) is not uncommon. Isolated TB of appendix was not found in this study. Gastric TB is rare, possibly due to paucity of lymphoid follicles. In the present study, one patient of a solitary ulcer in the gastric fundus (posterior wall) due to Tuberculous vasculitis was seen. Retrograde lymphatic spread of infection from the regional perigastric lymph nodes was conjectured in this case.

Though tuberculous lesions are broadly classified as ulcerative, hypertrophic, ulcero-hypertrophic type, often clear cut distinction is not present¹³. Frequency of above types in our material is almost similar to what has been reported by Hoon et al⁹. Though primary hypertrophic TB of the colon is rare, one of the three isolated colonic TB was of the hypertrophic variety in this study. The patient presented with abdominal pain and diarrhea for seven years.

The literature is deficient regarding the involvement of different lymph nodes other than the mesenteric group. In patients who had received antitubercular therapy, characteristic granulomas often disappear in the intestine but are present in the mesenteric lymph nodes¹³. This study showed frequent mesenteric lymph nodes (80%) involvement, followed by hilar lymphnodes (11%). Microscopically, epitheloid cell granulomas (discrete and confluent) were seen in all forty patients (100%), whereas caseation necrosis was found only in 32 patients (80%). AFB were more commonly detected in the lymph node sections. Caseation was noted in the sections of intestine and lymph nodes in 80% and 51.3% of our patients respectively. While in a study by Anand, caseation necrosis in the mesenteric nodes was seen in all specimens and in only 10% of the bowel sections¹⁰.

Due to histologic similarities of TB with other granulomatous lesions, demonstration of tubercle bacilli under Ziehl Neelsen staining or their isolation in culture and animal inoculation or PCR technique should be undertaken in every suspected case of TB. In the past, despite vigorous efforts, AFB detection rate has been not higher than 16–20%^{1,8}. Das and Shukla were able to demonstrate AFB on histological sections in 80% of tissues with caseation, in 40% of tissues showing granulomas with giant cells and in 45.5% of tissues with nonspecific granulomas¹⁴. We cannot compare the present study with other series as only AFB positive cases on histology (bowel and or lymphnodes) were studied.

However acid fast bacilli positivity was slightly more in lymph nodes (85%) compared to in the bowel sections (75%) similar to the observations by Das and Shukla¹⁴.

CONCLUSION

Incidence of Gastrointestinal Tuberculosis (GITB) at autopsy was found to be 0.68%. Overall, secondary form of Gastrointestinal Tuberculosis (GITB) was the commonest. Associated Tuberculosis in the mesenteric lymph nodes was frequent.

REFERENCES

1. Chuttani HK. Intestinal tuberculosis. In: Card WI, Creamer B, eds. Modern Trends in Gastroenterology. London: Butterworths, 1970:308-27.
2. Kapoor VK. Abdominal tuberculosis. Postgraduate Med J 1998;74: 459-67.
3. Chen WS, Leu SY, Hsu H, et al. Trend of large bowel tuberculosis and the relation with pulmonary tuberculosis. Dis Colon Rectum 1992;35:189-92.
3. Tribedi BP, Gupta DM. Intestinal tuberculosis in Bengal. J Indian Med Ass 1941;11: 41-4 .
4. Bhansali SK. Abdominal tuberculosis. Experience with 300 cases. Am J Gastroenterology 1977;67:324-37.
5. Bannerjee BN. Chronic hyperplastic ileocecal tuberculosis. Ind J Surg 1950; 12: 33-41.
6. Mitchell RS, Bristol LJ. Intestinal tuberculosis: an analysis of 346 cases diagnosed by routine intestinal radiography on 5529 admissions for pulmonary tuberculosis 1924-1949. Am J Med Sci 1954;227:241-9.
7. Chuttani HK, Sarin SK. Intestinal tuberculosis. Ind J Tub 1985;32:117-25.
8. Hoon JR, Dockerty MB, Pemberton de J. Ileocecal tuberculosis including a comparison of this disease with nonspecific regional enterocolitis and non-caseous tuberculated enterocolitis. Int Abst Surg 1950;60: 417- 40.
9. Anand SS. Hypertrophic ileocecal tuberculosis in India with a record of 50 hemicolectomies. Ann Roy Coll Surg Engl 1956;19:205-22.
11. Paustian FF, Bockus HL. So-called primary ulcero-hypertrophic ileocecal tuberculosis. Am J Med 1959;27:509-18.
12. Chandra A, Basu AK. Cicatrizing lesions of the ileocecal region. Indian J Surg 1967;29:645-59.
13. Tandon HD, Prakash A. Pathology of Intestinal tuberculosis and its distinction from Crohn's disease. Gut 1972;13:260 -9.
14. Das P, Shukla HS. Abdominal tuberculosis- demonstration of tubercle bacilli in tissues and experimental production of hypertrophic enteric lesions. Br J Surg 1975;62:610-7.
15. Wig JD, Malik AK, Chaudhary A, et al. Free perforation of tuberculous ulcers of the small bowel. Ind J Gastroenterol 1985;4:259-61.
16. Nagi B, Lal A, Kochhar R, et al. Perforations and fistulae in gastrointestinal tuberculosis. Acta Radiologica 2002;43:501-6.