

## ORIGINAL ARTICLE

### EXTRA PULMONARY CHILDHOOD TUBERCULOSIS

By

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**Aim:** In Egypt T.B lymphadenitis and abdominal T.B are relatively common in children and sometimes difficult to diagnose. Also, complete cure may be difficult to achieve. The aim of this study is to evaluate the accuracy of the diagnostic tools used for early diagnosis of the disease and the role of the pediatric surgeon in its management.

**Methods:** Ninety two of clinically suspected extrapulmonary T.B (59 females, 33 males) attended at Assiut University Hospitals were included in the study. Their ages varied from 6 months to 15 years. They were 58 cases of T.B lymphadenitis, 30 cases of abdominal T.B and 4 T.B of skin.

**Results:** Fine needle aspiration (FNA) biopsy from T.B lymphadenitis was diagnostic in 90% of cases. Surgical excision of tuberculous lymph nodes larger than 2 cm or T.B ulcer, after 2 months, treatment by antituberculous drugs, is important as it removes the pathological lesion. Laparoscopy and laparoscopic biopsy are the most useful diagnostic tools in abdominal T.B in properly selected cases.

**Conclusion:** Extrapulmonary tuberculosis in children is still not infrequent. FNA biopsy of lymph nodes proved to be successful in establishing diagnosis in the majority of cases and in endemic areas should replace and save the patients from excisional biopsy. Excision of large tuberculous lymph nodes not, responding enough after 2 months of anti T.B treatment, is recommended. Diagnostic laparoscopy, in properly, selected cases, is a safe procedure and can confirm the diagnosis.

**Keywords:** Abdominal tuberculosis, tuberculous lymphadenitis.

## INTRODUCTION

Tuberculosis is a global health concern affecting 20% of the world population with 8 million new cases and 3 million deaths yearly. Of these 1.3 million cases and 450,000 deaths occur in children.<sup>(1,2)</sup> The incidence of the disease is increasing all over the world due to increased infection with HIV, the use of immunosuppressive drugs, poverty, immigration and the limited access to medical services. In addition, the asymptomatic nature of pulmonary tuberculosis in children and its slow progressive course leads to late presentation, delay in diagnosis and extension of the disease to other parts of the body.<sup>(1)</sup> Another

problem is the long course treatment required and also the emerging resistance of T.B to the classically used antituberculous drugs.

Children are more predisposed to develop extrapulmonary tuberculosis which can be so severe.<sup>(3)</sup> In endemic areas it is relatively common, in children to encounter tuberculous lymphadenitis, abdominal and cutaneous tuberculosis which are difficult to differentiate - on clinical grounds - from non tuberculous conditions that need a completely different lines of treatment.<sup>(4)</sup>

The aim of this study is to evaluate the accuracy of the

diagnostic tools in extrapulmonary tuberculosis especially FNA and laparoscopy, as well as the role of the paediatric surgeon in its management.

## PATIENTS AND METHODS

This study included 92 cases suspected to have extrapulmonary tuberculosis presented to Assiut University Hospitals during the period of March 2005 to August 2008. They were 59 females and 33 males. Their age ranged from 6 months to 15 years. The duration of the disease varied from 3 weeks to 1.5 years. They were 58 cases with tuberculous lymphadenitis, 30 patients with abdominal tuberculosis and 4 with cutaneous tuberculous. Full history and clinical examination were done for all patients. They were subjected to the following investigations: ESR, blood picture, tuberculin test, plain X-ray chest and abdomen, abdominal ultrasonography, fine needle aspiration (FNA) and excisional biopsy of lymph nodes and skin, endoscopy, laparoscopy and laparoscopic biopsy. The specimens obtained were examined histopathologically and bacteriologically for demonstration of caseating granuloma and/or acid fast bacilli to confirm diagnosis. Culture for T.B was not done as a routine because it takes a long time (6-7 weeks) when the diagnosis was already confirmed by other means.

All patients received antituberculous treatment in the form of isoniazide, rifampicin and pyrezenamide for 2 months and then isoniazide and rifampicin only were continued for a total course of 9 to 12 months.

## RESULTS

Results are shown in Tables 1-3 and Figures 1-6. Tuberculous lymphadenitis was cervical in 55 cases and axillary in 3 cases. They were slightly tender firm; mobile and very late may become fixed to surroundings.

The association of pulmonary T.B with extrapulmonary was present in 21.7% of cases, the BCG scar was positive in 67% of cases and tuberculin test was positive in 65% of cases.

Ziehl-Neelsen stain revealed AFB in 13 cases of tuberculous lymphadenitis (22.4%) and 5 cases with abdominal tuberculosis (16.7%).

FNA in 58 cases with lymph nodes revealed caseating

granuloma in 52 cases (90%). The remaining 6 cases were diagnosed by excision biopsy. Caseation and cold abscess formation occurred in 8 cases (while under anti TB treatment) necessitating aspiration. Sinus formation from lymph nodes was encountered in 3 cases.

Excision of lymph nodes more than 2 cm in size not responding enough, after two months treatment, were done in 12 cases, two of them having discharging sinus.

Abdominal tuberculosis was in three forms: a) mainly gastrointestinal in the form of stricture or hyperplastic mass (10 cases). b) mainly mesenteric, mesenteric lymph nodes and omentum in the form of mass, adhesions, amalgamations or contracture (11 cases) and c) tuberculosis ascitis in 9 cases (Figs. 1-6). Fourteen of the cases presented with chronic or acute on top of chronic intestinal obstruction. The remaining cases presented with vague recurrent abdominal pain, chronic diarrhea, anorexia and loss of weight. Abdominal mass was palpable in 6 cases and abdominal distension due to ascitis in 9 cases. Both chronic obstructive symptoms and palpable mass were encountered in just mesenteric and omental affection only.

Plain X-ray abdomen revealed air-fluid levels and bowel dilatation in 11 cases and calcified mesenteric nodes in two. Barium study showed stricture of the small intestine in 6 cases and deformity of the ileocecal region in 4 cases.

CT scan of the abdomen in one case revealed mass affecting the greater curvature of the stomach and gastroscopy for the patient revealed ulceration of the overlying gastric mucosa. The result of the endoscopic biopsy was inconclusive. Laparoscopy and laparoscopic biopsy was successful and confirm the diagnosis of T.B in this case and in another 12 cases and not completed in one case because of the presence of peritoneal adhesions.

Laparotomy and excisional biopsy confirm the diagnosis of T.B in 17 cases.

Of the 4 cases of cutaneous tuberculosis, two have associated pulmonary tuberculosis. They are diagnosed as lupus vulgaris. One patient with abdominal tuberculosis associated with extensive pulmonary lesion died while she was on anti-tuberculous treatment.

**Table 1. The frequency of associated pulmonary T.B, positive BCG scar, tuberculin test and Z-N stain in 92 cases of extrapulmonary T.B.**

	Associated pul. T.B	+ve BCG scar	+ve Tuberculin test	Detection of T.B by Ziehl Neelsen stain
T.B. LN (58)	9/58 (15.5%)	40/58 (68.9%)	45/58 (77.6%)	13/58 (22.4%)
Abd. T.B (30)	9/30 (30%)	20/30 (66.6%)	13/30 (43%)	5/30 (16.7%)
Skin T.B (4)	2/4 (50%)	2/4 (50%)	2/4 (50%)	0 (0%)
Total (92)	20/92 (21.7%)	62/92 (67%)	60/92 (65%)	18/92 (19.5%)

**Table 2. The frequency of the different diagnostic tools done in 92 cases of extrapulmonary T.B.**

	No. of cases done	No. with positive findings (%)
<b>1) T.B. LN (58)</b>		
* FNA	58	52 (90%)
* Excision biopsy	6	6 (100%)
<b>2) Abdominal T.B (30)</b>		
* Laparoscopy biopsy	14	13 (92.8%)
* Laparotomy	17	17 (100%)
* Aspiration of ascitic fluid & Z-N staining	9	1 (11%)
<b>3) Skin T.B excision biopsy (4)</b>	4	4 (100%)

**Table 3. Therapeutic surgical procedures done for cases of extrapulmonary T.B.**

	No. of cases	%
<b>1) T.B LN (58)</b>		
• Aspiration of cold abscess	8/58	13.18%
• Therapeutic excision	12/58	20.7%
<b>2) Abdominal T.B (30)</b>		
• Small intestinal resection & anastomosis	6/30	20%
• Ileocectomy of hyperplastic mass	4/30	13%
• Adhesolysis of bands	4/30	13%
• Deroofing & evacuation of encysted caseous mesenteric T.B	1/30	3%
• Partial gastrectomy & gastroduodenal anastomosis	1/30	3%
• Exploratory laparotomy ended by biopsy	1/30	3%



**Fig 1. T.B. lymphadenitis with secondary infection with skin ulceration.**



**Fig 2. Cutaneous tuberculosis - lupus vulgaris.**



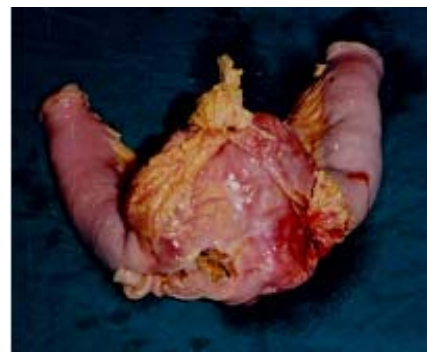
**Fig 3. T.B. ascitis and axillary T.B. lymphadenitis.**



**Fig 4. Abdominal CT with contrast showing T.B mass involving the greater curvature of the stomach.**



**Fig 5. The characteristic yellowish white tubercles on the mesentery and serosa of the intestine.**



**Fig 6. Ileocectomy for hypertrophic ileocecal tuberculosis.**

## DISCUSSION

Children are more predisposed to develop extrapulmonary tuberculosis which may be in severe forms like miliary tuberculosis and tuberculous meningitis and may be fatal unless diagnosed early and treated in timely manner.<sup>(3,5,6)</sup> It was reported that 25-30% of children with T.B have an extrapulmonary presentation in contrast to 15% in adult.<sup>(1)</sup> This is evident from our study where symptomatic pulmonary infection was associated with the extrapulmonary T.B in 20 out of 92 cases (21.7%). The frequency of the disease and development of its severe forms in Upper Egypt points to the fact that there is decrease in patient immunity as well as the prevalence of protein energy malnutrition and the low socioeconomic class in the majority of cases; in addition to the wide spread use of corticosteroids and other immunosuppressive drugs.

In spite of the obligatory BCG vaccination in the neonatal period, our results showed positive BCG scar in 62 out of 92 cases (67%). This indicates either ineffective vaccination or lowered immunity of children. This is confirmed from our results where tuberculin test was positive only in 60 children out of 92 (65%).

AFB was recovered in only 18 of our cases (19.5%). Other authors reported AFB in 3% to 20% of cases and the yield of culture in 20-70%.<sup>(3,4,7,8)</sup>

In our series FNA from lymph nodes showed the characteristic caseating granuloma of T.B in 52 out of 58 cases (90%) done. It was sensitive, specific, more rapid and does not need preparation for the patient or hospital admission. This in contrast with excisional biopsy which, although confirm the diagnosis in the 6 cases it is a traumatic procedure and may result in ugly scar or sinus formation. This in agreement with the results of other authors.<sup>(8,9)</sup> So, in endemic areas it is preferable not to wait for the results of culture or to subject the patients to surgical excision with its drawbacks.

Laparoscopy and laparoscopic biopsy proved to be safe and effective procedure in properly selected cases. It confirms the diagnosis in 13 out of 14 cases (92.86%) and saved these patients from laparotomy. The use of laparoscopy for diagnosis of abdominal tuberculosis was recommended by other authors.<sup>(1,10)</sup> Sometimes laparoscopy is difficult and exploratory laparotomy is required in such cases and it was done in 17 of our patients to reach a diagnosis and to do the treatment. The appearance of tubercles as small millimetric yellowish white nodules on the peritoneal surfaces and the intestinal wall is characteristic and should raise the suspicion of the diagnosis of T.B when encountered during laparoscopy or laparotomy. The demonstration of FAB in the ascitic fluid

is rare (3%-20%) in the majority of cases.<sup>(5)</sup> As shown from our results only one sample out of nine of ascitic fluid showed AFB. Other authors<sup>(11)</sup> suggest open peritoneal biopsy, from a limited incision in the right iliac fossa, as the most useful investigation for diagnosis of abdominal tuberculosis and an ascitic fluid with protein content of 2.5 gm/or more and a predominantly lymphocytic count of 100/mm<sup>3</sup> is highly suggestive of the diagnosis.<sup>(11)</sup>

Other laboratory diagnostic tests including adenosine deaminase activity of the ascitic fluid, enzyme linked immunosorbent assay (ELISA) and soluble antigen fluorescent antibody test (SAFA) have been suggested to diagnose abdominal T.B but have not achieved widespread use owing to the poor predictive value and their cost.<sup>(5,12)</sup> However, other authors reported the usefulness using polymerase chain reaction (PCR) for diagnosis of T.B lymphadenitis.<sup>(13,14)</sup>

Concerning treatment of tuberculous lymphadenitis, aspiration of caseating nodes was done in 8 cases and therapeutic excision of lymph nodes larger than 2 cm and not responding enough after two months treatment in 12 cases. This maneuver removes the pathologic focus, preventing sinus formation and spread of the disease to other sites in the body. This is in agreement with opinion of other workers.<sup>(15,16)</sup>

Concerning abdominal tuberculosis, it was reported that it constitutes the second and sixth most common site of tuberculosis in developing and developed countries respectively.<sup>(3,6,17-19)</sup> Direct gastrointestinal affection was encountered only in 11 of our cases and secondary involvement of the bowel by mesenteric and peritoneal pathology occurred in another 4 cases. The pathology in the remaining 15 cases, was peritoneal and mesenteric. This is in agreement with that reported by other authors about the higher frequency of peritoneal and mesenteric affection than the gastrointestinal one in children.<sup>(20,21)</sup> Its complications such as pain, obstruction, mass, perforation, fistulization or haemorrhage leads to hospitalization and involvement of the paediatric surgeon in their care.<sup>(17,22)</sup> We did not encounter any case of perforation or fistula formation in this series.

Treatment of T.B is essentially medical and the surgical treatment when indicated should be individualized and conservative. In our series localized resection of the small intestine because of stricture was performed in 6 cases, ileocectomy for hyperplastic ileocecal T.B in 4 and just adhesolysis in another 4. Deroofing of a tuberculous mesenteric cyst and evacuation of the caseous material was done in one case. Partial gastrectomy and gastroduodenal anastomosis was done in another case after 3 months of antituberculous treatment which failed to control the severe epigastric pain, vomiting and occasional

haematemesis in this patient. Preoperative gastroscopy for this case revealed oedema and minute ulceration of the overlying gastric mucosa and endoscopic biopsy was inconclusive. Laparoscopy and biopsy settle the diagnosis. It is well known that gastric tuberculosis is very rare and surpassed in rarity only by primary lesion affecting the oesophagus.<sup>(23)</sup>

The majority of our cases responded well and improved. Resistance to the antituberculous treatment was encountered in 10 cases with lymphadenitis, 5 cases of abdominal tuberculosis and one case of cutaneous T.B. This required prolongation of the course of therapy to one year or more and replacement of pyrezenamide by ethambutol. Testing for drug sensitivity is essential in resistant cases. This is in agreement with the opinion of other authors.<sup>(24)</sup>

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