

Extrapulmonary tuberculosis in surgical aspect- expanded challenging disease spectrum

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Abstract

Introduction: This study was designed to analyse wide spectrum magnitude of extra pulmonary tuberculosis in surgical aspect with its clinico-patho-radiological profile and treatment modalities. **Material and Methods:** The study was conducted in postgraduate Department of Surgery in collaboration with Department of Chest and Tuberculosis, Pathology and Radiodiagnosis of Rohilkhand Medical College and Hospital Bareilly, Uttar Pradesh, India, after formal approval from institutional ethics committee. This study is of prospective study, in duration of January 2015 to April 2018. **Inclusion criteria:** All suspected cases of extra pulmonary tuberculosis (EPTB). **Exclusion Criteria:** (1) HIV patients (2) Patients with pulmonary tuberculosis. **Result:** A total of 59 patients with suspected EPTB were included, investigated and treated with or without surgical intervention followed by standard ATT regimes. **Pathological / Microbiological:** FNAC, Histopathology, AFB in sputum & CBNAAT, BACTEC 460, ADA. **Radiological:** X-Ray chest, X-ray abdomen. Ultra-Sonography (USG), Contrast Enhanced Computer Tomography (CECT). Patients admitted in emergency department and attending surgical out patient department were investigated and treated as per protocol. In our study 39 patients out of 59 underwent different surgical procedure and followed by antitubercular treatment regime. 20 Non-operated patients treated medically with antitubercular treatment regime [ATT]. **Conclusion:** EPTB has same national health issue as pulmonary tuberculosis. For tuberculosis control, EPTB-A challenging disease should be early diagnosed and surgically and medically treated to decrease related morbidity and mortality.

Keywords: EPTB, Surgical Intervention, Anti Tubercular Treatment [ATT]

Introduction

Tuberculosis is one of the major causes of death in the world, globally around 8.8 million people develop T.B. and 1.45 million people die every year due to T.B. The burden of T.B. in India is the highest, approximately one fifth (21%) of the global incidence. Tuberculosis among the most intensively clinically studied of all human disease and tuberculosis can infect any organ in the body.

A. Tuberculosis is a specific infectious disease caused by mycobacterium tuberculosis. This disease primarily affects lungs parenchyma known as pulmonary tuberculosis - world-wide public health issue.

B. Extra- Pulmonary Tuberculosis [EPTB]- Refers To Any Bacteriologically Confirmed Or Clinically diagnosed case of T.B. involving organs other than lungs e.g. pleura [26%], lymph nodes [17%], genitourinary [15%], bones [14%], military [8%], peritoneum [4%] and gastrointestinal T.B [1%] rarely breast, vascular and penile T.B. [1,2,3].

It was found that the percentage of EPTB diagnosed is more in tertiary care centre because of better investigative facilities. But due to paucity of data, there are no formal national or international programmes for EPTB as national pulmonary tuberculosis control programme. Tuberculosis affects all ages, more prevalent in males than females, in low mid socio-economic status and malnutrition. No established screening programme for EPTB are available. Clinically

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suspicious patients are investigated patho-radiologically. X-Ray chest performed in all patient to exclude pulmonary tuberculosis. USG is the second commonest non-invasive investigation. CECT is gold standard test

done in selected cases. To confirm bacteriologically patient were subjected for AFB in sputum/ fluid, ADA in fluid, BACTEC460, CBNAAT & histopathologically by FNAC and Tissue Biopsy.

Materials and Methods

Methods

Place of Study: The study was conducted after permission from institutional ethical committee in Post-Graduate Department of Surgery at Rohilkhand Medical College and Hospital, Bareilly (U.P.), India.

Type of Study: Prospective Study in duration of January 2015 to April 2018

Sampling Methods and Sample Collection: The study includes all patients coming to surgery department as O.P.D. patients or EMERGENCY patients. All 59 suspected cases were investigated on clinic-patho-radiological basis. Confirmed or Clinical cases of Tuberculosis were registered with DOTS centre. This study was mainly focused at surgical aspect of variants of EPTB viz. abdominal, musculoskeletal, breast, genital, lymph nodes and pleural tuberculosis.

Inclusion Criteria: All suspected cases of extra pulmonary tuberculosis (EPTB).

Exclusion Criteria

- HIV Patients
- Pulmonary T.B

Treatment modalities: All patients of EPTB were treated with standard antitubercular drugs in collaboration of T.B. and Chest department.

Recommended drug regime as per RNTCP [2016] daily dose guidelines

Type of Cases	Intensive Phase	Continuation Phase
New Case	[2 –months] HRZE	[4-months] HRE
Previously Treated Case	[2-months] HRZES + [1-month] HREZ	[5-month] HRE

Fixed Doses Combination for Adult-Daily Dose

Weight Category in Kg	Intensive Phase: HRZE 75/150/400/275 mg	Continuation Phase: HRE75/150/275 mg	Injection- Streptomycin
25—39	2 tablets	2	.5gm
40—54	3 tablets	3	.75 gm
55—69	4 tablets	4	1gm
>70 kg	5 tablets	5	1gm

Surgical Treatment

1. **Abdominal Tuberculosis:** It includes exploratory Laparotomy with adhesiolysis, Bowel resection and Anastomosis, Bowel Perforation-Primary Repair, Ileostomy followed by ATT for 3 months then Ileostomy Closure and ATT continued, Omentectomy, Peritoneal Lavage & Drainage, Strictureplasty & Mesenteric Lymph node biopsy
2. **Tubercular Abscess/Sinus:** USG guided aspiration of Encysted Collection, Psoas and cold Abscess Incision & Drainage & Excision of sinus.
3. **Genital Tuberculosis Male:** Penile lesion require circumcision and biopsy.
4. **Genital Tuberculosis Female:** Primary sterility, Tubo-Ovarian mass requires TVS and D&C.

Results

Table-1: Age Distribution

Age Group (Years)	Total Patients	Percentage (%)
10-19	09	15.2%
20-39	40	67.8%
40-60	07	11.9%
>60	03	5.1%

Table-2: Sex Distribution

Sex	No. Of Patients	Percentage (%)
Male	28	47.4%
Female	31	52.4%

Tables 1 & 2 show male predominance [1.3: 1] after exclusion of breast T.B. [8] & genital T.B. [2]. But in general men and women each accounted half of cases. Out of 59 cases 28 (47.4%) were males, 31 (52.4%) were females. Among the 5 age groups studied, the age group of 20-39 years had the highest proportion of EPTB 40(67. 8%). But in this group females more involved due to breast & endometrial T.B. Common age group 20—39 years [adults] was diseased with T.B. [40/59 pt. 67.8%]. Next most affected group was 10-19 years with (M: F 4:5).

Table-3: Systemic Presentation of EPTB

System Involved	Type of EPTB	No. of Cases	Percentage
Abdomen	1) Acute	24	40.67%
	2) Chronic	07	11.86%
Musculoskeletal	Pott's spine & Psoas Abscess	08	13.55%
Breast	Lump, Sinus& Ulcer	08	13.55%
Lymph-nodes	Cervical axillary	05	8.47%
Pleural tuberculosis	EffusionEmpyema	05	8.47%
Male genital	Penile	01	1.69%
Female genital	Endometrial and Tubo-Ovarian	01	1.69%

Table 3 shows that maximum no. of cases belonging to abdominal tuberculosis mainstay of surgeon's speciality (52.5%). Abdominal T.B. presented as acute abdomen (40.6%) with variants of intestinal obstruction (22%), perforation peritonitis (10.1%), pyoperitoneum (3.4%), omental T.B. (3.4%) and ileal stricture with mesentric L.N. (1.7%).

Chronic abdominal T.B. (11.8%) as SAIO (10.1%) and the rare form of colonic T.B. (1.7%). One case of SAIO presented with ileo-caecal T.B. and DVT of iliac vein. 2nd most common EPTB was musculoskeletal T.B. (13.55%) presented as Psoas abscess, Pott's spine & sinus. Breast T.B.a rare entity presented as Lump, Sinus, & Ulcer (13.55%) followed by T.B. lymphadenitis (8.4%), Pleural T.B., rarely male genital T.B. as penile ulcer (1.69%), and female genital T.B. as primary sterility, amenorrhoea with intestinal T.B.

Table-4: Radio-Pathological Profile.

Investigations	No. Of cases	Percentage (%)
X-ray Chest	59	100
X-ray Abdomen	32	54.2
Ultrasonography	53	89.8
CECT Abdomen/Chest	09	15.3
FNAC	20	33.9
PPD	19	32.2
Histopathology	33	55.9

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Table 4 shows X-ray Chest PA view done all patients to exclude pulmonary tuberculosis. 5/59(8.4%) shows pleural disease. Ultrasonography of involved system done in 53/59 (89.8%) patients non-invasive, available, used as diagnostic and therapeutic purpose. CECT ABD/CHEST is gold standard investigation but costly done in 9/59 (15.3%). All Patho-Microbiological {FNAC, HPE, PPD, ADA & AFB} confirmed strong evidence of difficult EPTB 36/59 (61.1%).

Table-5: Surgical Intervention.

Disease	No. Of Cases	Type of Surgery
Intestinal Obstruction	13	Exploratory Laparotomy
Perforation Peritonitis	06	Exploratory Laparotomy
Pyoperitoneum	02	Exploratory Laparotomy
Omental T.B.	02	Exploratory Laparotomy
Ileal Stricture and mesentriclymph nodes	01	Exploratory Laparotomy
Psoas Abscess	08	Incision & Drainage Open/USG Guided
Penile T.B.	01	Circumcision
Endometrial T.B.	01	Diagnostic Dilatation & Curettage
Empyema Thoracis	01	Intercostal Chest Drainage
Breast	04	Incision & Drainage /Edge Biopsy
Total	39	

Table-5 shows 24 patients of Abdominal Tuberculosis treated surgically with Exploratory Laparotomy. Adhesinolysis [11.8%], Ileostomy + ATT [8.4%], Resection & Anastomosis [6.8%], Mesenteric Lymph Node Biopsy [1.7%], Repair of Perforation [5.1%], Peritoneal Lavage [3.4%] and Omentectomy [3.4%]. 7/59 pts. [11.8%] were treated conservatively. Out of 7 Patients 5 were presented as SAIO [Sub Acute Intestinal Obstruction [10%], 1 patient as Colonic T.B. [1.7%] and 1 patient with SAIO with DVT Of iliac vein. [Rare presentation].

Table-6: Surgical modalities in EPT

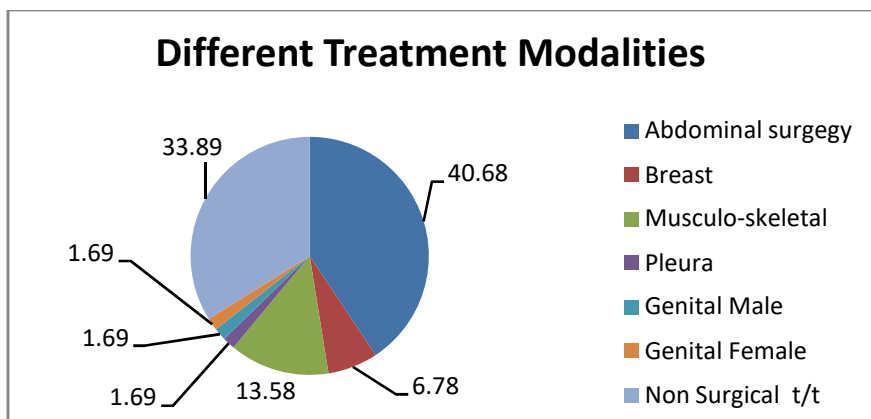


Table-6, Pie Chart shows 66.11% cases of different types of EPTB were surgically intervened +ATT and 33.89% with ATT only.

Table-7: Outcome of EPT cases

Confirmed Cases	42	71.2%
Clinical Cases	17	28.8%
ATT Completed	50	84.7%
ATT Continued	6	10.1%
ATT Defaulter	2	3.4%
Mortality	1	1.7%

All 59 patients of EPTB treated surgically or medically were properly explained about disease and its regular treatment. All were advised for regular follow up. Table-3, shows that 42/59 (71.2%) were confirmed case and 17/59 (28.8%) were treated on clinical basis with adequate response to ATT. 50 Cases (84.7%) completed ATT regime as advised. 6/59 Cases (10.1%) recently managed are taking ATT but 2/59 Cases (3.4%) lost follow up and 1/59 case (1.7%) expired in immediate postoperative period due to associated septicaemia.

Discussion

Mycobacterium lymphadenitis has plaque humanity since long. The classic term scrofula derived from Latin word glandular swelling. Its mediastinal, axillary, mesenteric, hepatic and inguinal lymph nodes. Clinical presentation may be as swelling, cold abscess, sinus, and non-healing ulcer. Diagnosis by FNAC, Mantoux test, AFB and excisional biopsy. Antitubercular treatment is mainstay.

1. Abdominal tuberculosis

Abdominal tuberculosis can involve mouth to anus of GI system as sixth common participant of EPTB. Only 14% newly diagnosed cases of EPTB includes Pleura [26%], Lymph Nodes [17%], Genitourinary [15%], Bone [14%], Peritoneum [4%], military [8%] and Surgeon's main territory Gastrointestinal EPTB [1%]. Hollow viscus peritoneum, solid organs, omentum and mesenteric lymph nodes. Abdominal tuberculosis infection reaches by 6 routes- [1]-Haematogenous, [2] - Ingestion of bacilli infected sputum[3]- Direct spread from adjacent organ,[4]-Lymphatic, [5] - Retrograde from female genitals, [6]- Mycobacterium bovis [4,5,6].

Common clinical presentation in young adults, male > females with complaints of abdominal pain, malaise, weight Loss, sub-acute intestinal obstruction, acute Intestinal obstruction intestinal perforation, abdominallump and rarely per rectal bleeding. In tubeculous peritonitis, the peritoneum is studded with multiple yellow white tubercles. It is thick and hyperemic with a loss of its shiny luster. The omentum is thickened and studded with tubercles. [7,8]

The most common complication of tuberculosis of small bowel or ileocaecum is obstruction due to adhesion or stricture. Adjacent lymphnodal enlargement or caseation cause traction on bowel and adhesion. Tandon et al showed in his study that trends of SAIO is increasing and treatment is conservative [ATT] [9,10].

Tuberculosis accounts for 5-9% of perforation peritonitis. Perforation may be single and proximal to stricture[pic] Ruptured caseating tubercular lymph node may cause pyoperitoneum with peritonitis. Manifestation of peritoneal T.B. May be of 3 types:

1. Wet Type Ascites
2. Dry Type Adhesions
3. Fibrotic Type with omental thickening encysted collection or cocoon.

Mesenteric lymph nodes may be enlarged, matted & caseated. Characteristic T.B. Granuloma may be seen [11]. Hoonet al. originally classified intestinal T.B. Into ulcerative, ulcero-hyperplastic and hyperplastic. Ulcerative mainly seen in malnourished patients while hyperplastic in well-nourished patients. Abdominal T.B. May present as acute, chronic, & acute on chronic forms and yet many times it may be incidental findings. An uncomplicated abdominal T.B. treated medically by ATT, but complicated with ac abdomen e.g. Perforation, obstruction, treated by exploratory laparotomy & ATT [12,13].

Colonic tuberculosis constitutes 9.2% of abdominal cases and may involve sigmoid, ascending colon and transverse colon. Pain abdomen is main symptom and hematochezia is in less than one-third patients [14].

2. Musculoskeletal Tuberculosis

Psoas abscess: Psoas or iliopsoas abscess is a collection of pus in iliopsoas compartment and is of two types primary and secondary. Primary psoas abscess is caused by haematogenous or lymphatic route in immune-ocompromised & malnourished patients. Staphylococcus Aureus [88%], main agent followed by Streptococcus and E. coli. Secondary psoas abscesses caused as extension of infected foci in adjacent structure e.g. Pott's spine, ruptured thoracolumbar Abscess and Appendicular Abscess.

The classical triad of fever, flank pain and limited hip movement is seen only in 35% cases. Loin lump, groin lump with or without backache due to Potts Spine. Rarely DVT lower limbs may be presentation due to iliac vein compression. USG abdomenis cheap, easily available investigation.

CECT abdomenis goldstandard investigation. Pus culture, AFB, MANTOUX are other test for diagnosis. Treatment includes open incision & drainage, USG/CT guided aspiration or pigtail aspiration [15].

3. Breast Tuberculosis

The overall incidence of tubercular mastitis is reported to be 0.19 of all breast lesions while in developing countries it is approximately 3% of surgically treated patients. Breast T.B. found more in parous and lactating females. Presentation varied as breast lump, sinus, abscess and non-healing ulcer. Investigation include FNAC/AFB/USG/HPE etc. Treatment includes ATT/ ASPIRATION/I & D /EDGE BIOPSY etc [16,17,18].

4. Genital Tuberculosis

- Females → genitourinary T.B. Is common form of EPTB worldwide [27%] with genital T.B. ascending peritonitis and infertility & sterility.
- Males → penile tuberculosis including preputial is extremely rare in comparison to epididymis and testis penile tuberculosis mimics penile carcinoma, granulomatous ulcer, genital herpes, granuloma inguinal and HIV infection. primary penile T.B. are transmitted through female partner having active genital tuberculosis.

So both partners should be investigated and treated. H/o B.C.G for immunotherapy in carcinoma urinary bladder to be rule out. T.B. affecting penis can be tubercular chancre, papulo-necrotic tuberculoid, tuberculosis gumma or tuberculosis cutis orificialis [19,20,21].

Medical Treatment: All 59 patients were treated with ATT as per RNTCP [2016] guidelines. Postoperative cases of abdominal tuberculosis were treated with injection Streptomycin. 5GM/.75GM I/M [AST] daily + inj. Levofloxacin 100ml I/V infusion till patients are orally allowed then switch over to inj. STM + HRZE for 2 months followed by HRE for 4 months then extended to 9-12 months with Rifampicin and Isoniazid.

Pott's spine with psoas abscess and penile T.B. were treated on same regime. Rest of patients were treated with 6-month regime [22, 23].

Radiological Evidence

CECT Abdomen: Pott's spine with Lt. Iliopsoas Abscess



Figure-1

CECT scan of whole Abdomen reveals findings of destruction of multiple Lumbar Vertebrae (L3, L4, L5) with multiple Pathological fractures of L3-L4 with fragments intruding into Spinal Canal and with Para-Vertebral (PSOAS abscesses)? KOCH's Spine.

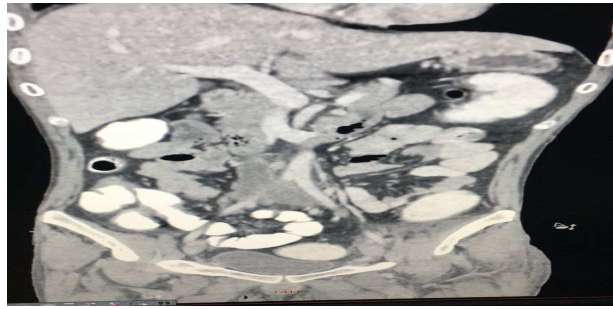


Figure-2

1. Circumferential wall Thickening involving Distal Ileum, Ileo-Caecal Junction and adjacent Cecum with Mesenteric and Retroperitoneal Lymphadenopathy. The appearance maybe related to infective etiology (Tubercular).
2. IVC and Illiac vein thrombus as detailed above.

Post-Op T.B. Jejuno-ileal-cutaneous fistula



Figure 3: Intestinal Tuberculosis

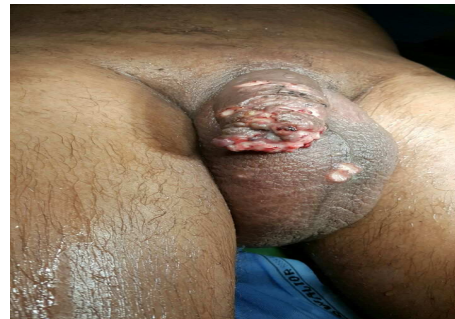


Figure 4: Penile Tuberculosis

HPE Findings

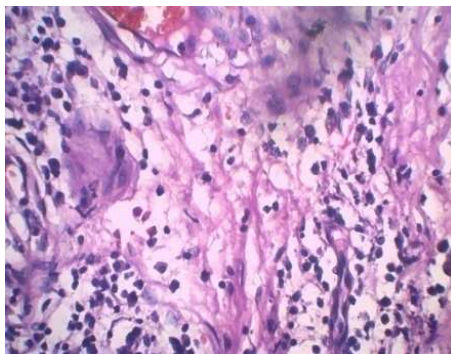


Figure 5

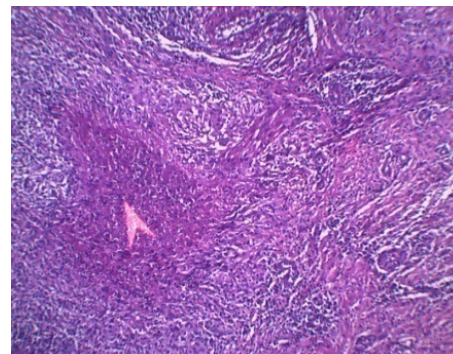


Figure 6

Microscopy:- Section shows stratified squamous epithelium of variable thickness revealing epithelial hyperplasia manifested by acanthosis and papillomatosis. At places epithelium is denuded. Sub-epithelial tissue is markedly infiltrated by Lymphocytes and Plasma cells. Few Granulomas formation with epithelial cells, langhans giant cells and central caseation seen. Marked vascular proliferation also seen. Impression- Tubercular Pathology (Tuberculosis Orificalis Cutis)

Conclusion

1. EPTBis a major health problem. Improving socio-economic status, effective BCG vaccination, better disease awareness, early diagnosis and strict adherence to ant tubercular treatment can reduce the mortality and complications.
2. Abdominal tuberculosis is a disease entity which is commonly encountered as surgical emergency in our part of the world.
3. This study shows that tuberculosis can involve any system, organ of human body. Nobody gets

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surprised with its rare, wide and varied presentations. So, the possibility of tuberculosis should be investigated and treated accordingly.

4. Though EPTB is not communicable disease but the morbidity and mortality related to it adversely affects the patients and their family socially and economically. It also puts burden on already stretched to limits health care system. Magnitude of expanded challenging EPTB should be taken serious as pulmonary tuberculosis. This requires more expertise of surgeon, chest & T.B. physician, pathologist and radiologist at tertiary health care centre.

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References

- 1.K. PARK Preventive and Social Medicine ;24thed., 2017 p. 187-92
2. Lönnroth K, Raviglione M. Global epidemiology of tuberculosis: prospects for control. doi: 10.1055/s-0028-1085700. Epub 2008 Sep 22.
3. Sharma SK, Mohan A. Extrapulmonary tuberculosis. Indian J Med Res. 2004 Oct;120(4):316-53.
4. Paustian f tuberculosis of intestine In Bockus HL, editor, gastroenterology, vol11, 2nd ed. Philadelphia: W.B. Saunders Co;1964 p.311.
5. Vij JC, Malhotra v, Choudhary V, Jain NK, Prasad G, Choudhary a, et al. A clinicopathological study of abdominal tuberculosis, Indian J Tuberc 1992;39:213-20.
6. Kapoor VK. Abdominal tuberculosis. Postgrad Med J. 1998 Aug;74(874):459-67
7. Aston NO. Abdominal tuberculosis. World J Surg. 1997 Jun;21(5):492-9.
8. Sharma MP, Bhatia V. Abdominal tuberculosis. Indian J Med Res. 2004 Oct;120(4):305-15
9. Gondal KM, Khan AFA. Changing patter of abdominal tuberculosis. Pak J Surg. 1995;11:109-13.
10. Tandon HD, Prakash A. Pathology of intestinal tuberculosis and its distinction from Crohn's disease. Gut. 1972 Apr;13(4):260-9.
11. Marshall JB. Tuberculosis of the gastrointestinal tract and peritoneum. Am J Gastroenterol. 1993 Jul;88(7): 989-99.
12. Kedar RP, Shah PP, Shivde RS, Malde HM. Sonographic findings in gastrointestinal and peritoneal tuberculosis. Clin Radiol. 1994 Jan;49(1):24-9.
13. Charokar K, Garg N, Jain AK, Surgical management of abdominal tuberculosis: a retrospective study from central India. Int Surg J. 2016;3(1):23-31.
14. Chaudhary A, Gupta NM. Colorectal tuberculosis. Dis Colon Rectum. 1986 Nov;29(11):738-41.
15. Vijai Goni, Babu Ram Thapa, Sameer Vyas, Nimal Raj Gopinathan, Sakthirval Rajan Manoharan, Vibhu Krishnan, Bilateral Psoas Abscess, Atypical Presentation of spinal tuberculosis, Archives of Iranian Medicines. 15 (4), 2012, 253-56.
16. Banerjee SN, Ananthkrishnan N, Mehta RB, Parkash S. Tuberculous mastitis: a continuing problem. World J Surg. 1987 Feb;11(1):105-9.
17. Richard S, Thebreast. In: Williams NS, Bulstrode CJ, O'Connell PR, editors. Bailey and Love's Short practice of surgery 26th ed. Boca Raton, FL: CRC press; 2013. p. 798-819.
18. Gupta D, Rajwanshi A, Gupta SK, et al. Fine needle aspiration cytology in the diagnosis of tuberculous mastitis. DOI:10.1159/000330975
19. Mehmood N, Najam S, Yunus M. Analysis of presentation of cutaneous tuberculosis in surgical department. JIIMC, 2008;(1):23-30.
20. Narayana AS, Kelly DG, Duff FA. Tuberculosis of the penis. Br J Urol. 1976 Aug;48(4):274.
21. Agarwalla B, Mohanty GP, Sahu LK, Rath RC. Tuberculosis of the penis: report of 2 cases. J Urol. 1980 Dec;124 (6): 927
22. World Health Organization, Treatment of tuberculosis: guidelines or national programmes. World Health Organization, Geneva, Switzerland. 2003.
23. WHO. WHO global tuberculosis report 2016. Available from http://www.who.int/tb/publication/global_report/en/ accessed on April 27, 2017.

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