Management strategy of mycobacterial cervical lymphadenitis

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Abstract

The objectives of this study were to investigate the typical clinical presentation, diagnosis and treatment of mycobacterial cervical lymphadenitis (MCL).

Medical records of 87 patients who were treated for MCL were retrospectively reviewed. Definitive diagnosis of MCL was made when a neck mass persisted for several weeks or months and one or more of the following was obtained: (1) positive mycobacterial cultures from biopsy material; (2) Positive mycobacterial staining of biopsy material; (3) Granulomatous inflammation and caseating necrosis on histopathological examination of biopsy material.

Clinical findings were reviewed prior to treatment. The treatment included standard antituberculous medications followed by surgery in which either total excision or selective nodal dissection of the cervical lump was made. Follow-up results are presented.

The chief complaint was a cervical mass that was localized mostly to the posterior cervical or submandibular regions. A fistula formation was encountered in 11.5 per cent. All patients recovered from MCL by combined antituberculous drug and surgical treatments.

Clinical presentation of the disease and histopathological assessment are important in the diagnosis of MCL as well as in the differential diagnosis of tuberculous and nontuberculous MCL. Utilizing the combined medical and surgical treatment options, both tuberculous and non-tuberculous cervical adenitis can be treated successfully.

Key words: *Mycobacterium tuberculosis;* **Mycobacterium, atypical; Lymph nodes; Neck**

Introduction

Mycobacterial infections have been shown to be increasing in number worldwide.[1] Mycobacterial cervical lymphadenitis (MCL) has increased in frequency in Turkey and it is still a problem as far as the diagnosis and treatment are concerned.[2] MCL is either a manifestation of a systemic tuberculous disease or a unique clinical entity localized to the neck. There are various subtypes of mycobacterium that can lead to cervical lymphadenitis. However, they can be divided into two major categories as *Mycobacterium tuberculosis* and atypical mycobacterium (or non-tuberculous mycobacterium). The former is easier to treat in contrast to the latter which is relatively resistant to anti-tuberculous medications.

This paper reviews the results of our experience in the management of mycobacterial cervical lymphadenitis, and its typical clinical presentation and diagnosis as well as methods of medical and particularly surgical aspect of its treatment.

Materials and methods

Medical records of 87 patients who were treated for MCL between 1990 and 1998, were retrospectively reviewed.

Past histories of the patients were taken that noted previous tuberculous infection or contact. Radiological and laboratory investigations were performed after a complete physical examination. Radiological assessment included chest X-rays and ultrasound examination or magnetic resonance (MR) or computed tomography (CT) imaging of the neck. The laboratory investigation included complete blood count, urinalysis, erythrocyte sedimentation rate, *Brucella* and *Toxoplasma* assays. A purified protein derivative test (PPD) was also performed on each patient.

Definitive diagnosis of mycobacterial lymphadenitis was made when a neck mass persisted for several weeks or months and one or more of the following was obtained: (1) positive mycobacterial cultures from biopsy material; (2) Positive mycobacterial
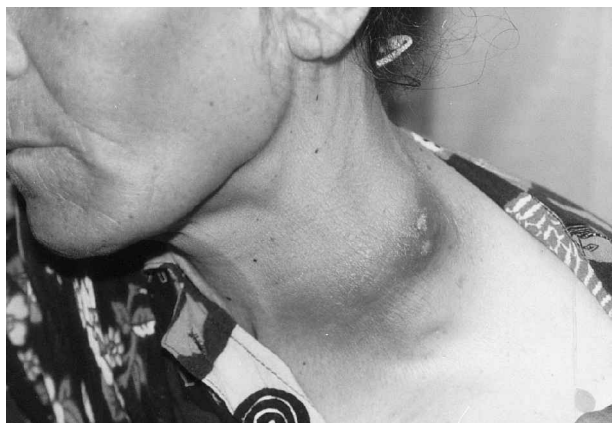
FIG. 1
Patient with mycobacterial cervical adenitis with a draining fistula.

staining of biopsy material; (3) Granulomatous inflammation and caseating necrosis on histopathological examination of biopsy material.

In the surgical procedure, either total excision of the cervical adenitis or selective nodal dissection of neck was performed, particularly when there was a high suspicion index of tuberculous infection. Curettage was made when skin necrosis was enountered, or for lesions adjacent to the accessory or other cranial nerves. The skin was not routinely excised unless a fistula or cosmetic deformity was encountered. Surgically excised materials were sent for histopathological and microbiological investigations.

After justifying the diagnosis of mycobacterial adenitis by histopathology without waiting for the culture result, medical treatment with anti-tuberculous drugs was initiated. The medical treatment protocol was as follows:

(1) Streptomycin, 1 g intramuscularly, every day for the first two weeks, proceeded by two to three times a week until three months with a total dose of not more than 45 grams.

(2) Rifampicin, 600 mg per day for six months.

(3) Isoniacid and ethambutol, 300 mg and 900 mg per day for 12 to 18 months, respectively.

Similar treatment protocols were applied for both tuberculous cervical lymphadenitis (TCL) and non-tuberculous or atypical cervical lymphadenitis (ACL). Duration of the medical treatment was different between the groups – 12 and 18 months for TCL and ACL, respectively. Periodic follow-up of the patients was made to study the clinical course of the disease and the side-effects of the drugs.

Results

A total of 87 patients were retrospectively reviewed. There were 45 males and 42 females. The ages ranged from three to 75 (mean 33) years. Eighteen patients (20.7 per cent) were less than 15 years of age.

The chief complaint was a neck mass and with a concomitantly draining sinus in some (Figure 1). A cervical fistula was encountered in 10 (11.5 per cent) patients. There was a history of tuberculous contact

and history of tuberculosis in 19 and 14 patients, respectively. The duration of the symptoms ranged from one month to 13 years (mean 11 months). The PPD test was positive (>10 mm), intermediate (5–9 mm) and negative (<5 mm) in 43 (49.4 per cent), 31 (35.6 per cent) and 13 (15 per cent) patients, respectively. Chest X-rays revealed findings consistent with the tuberculosis in 16 (19 per cent) patients. Histopathological examination, our main diagnostic tool, disclosed the diagnosis of granulomatous infection consistent with mycobacterial infection. Positive mycobacterial cultures were obtained only in 21 (25 per cent) patients of whom 16 had *Mycobacterium tuberculosis* and five had non-tuberculosis mycobacteria present.

Most of the *Mycobacterium tuberculosis* isolated cases had cervical adenitis in the posterior and supraclavicular regions as well as multiple or bilateral adenitis. They had either a history of pulmonary tuberculosis or tuberculous contact. The disease was mostly seen in adults. Furthermore, the majority of them showed a positive PPD test result and their chest X-rays usually showed the signs of active or previous tuberculous infection.

In the patients with ACL, there was no history of tuberculosis or tuberculous contact. The PPD test results were either intermediate or negative, and chest X-rays were normal. The patients usually presented with an enlarging neck mass without constitutional symptoms. The disease was more frequent in childhood. Neck sites around the mandible were the predominant sites for the cervical mass. Localizations of MCA are shown in the Figure 2.

All patients underwent surgery preceding the medical treatment. In the surgical treatment, either a total excision or a selective nodal dissection was made according to the status of cervical involvement. Total excision was made for singular cervical adenitis while selective nodal dissection was preferred for multiple cervical lumps. Curettage was made in three patients who had skin necrosis and in two patients whose adenitis was adjacent to the accessory nerve. Limited skin excision was made in 10 because of
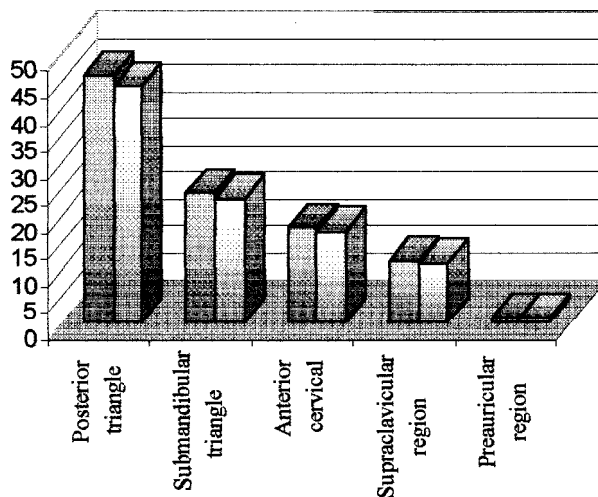

FIG. 2
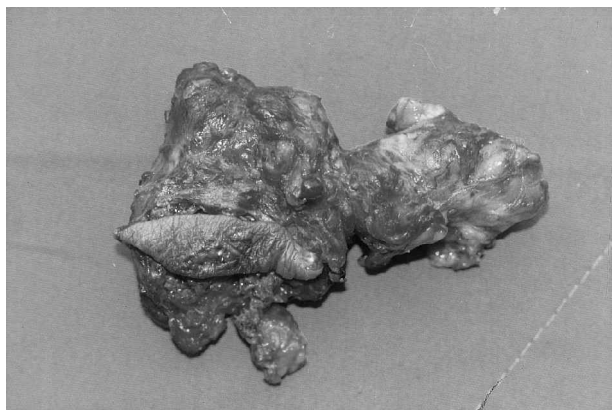Localization of mycobacterial adenitis.

FIG. 3

Surgical excision of a mycobacterial cervical adenitis. Note limited skin excision.

fistula formation (Figure 3). There was a pregnant woman with tuberculous cervical adenitis. Multiple puncturing, aspiration and compressive dressing were made until termination of the pregnancy, and subsequently surgical and medical treatments were carried out.

Complications were rare. Only one patient had a chylous fistula after the operation and was treated with local care and compressive dressing. Eighty patients were followed-up for at least two years, but seven patients have not completed or discontinued

FIG. 4

Coronal T_1-weighted spin-echo image (TE 15 msec, TR 500 msec) shows a well-circumscribed mass that is almost isointense relative to muscles in posterior cervical chain.

FIG. 5

After Gadolinium injection, coronal T_1-weighted spin-echo image (TE 15 msec, TR 500 msec) shows enhancement of the rim and internal septation of the nodes with a necrotic centre.

one year after treatment. There was no significant side-effect related to medications nor the recurrence of the disease within two years of follow up.

Discussion

The incidence of tuberculosis has progressively increased recently in this country. Tuberculosis is a chronic disease which can affect various regions of the human body. Cervical involvement of tuberculosis has also increased in parallel with the increasing incidence of tuberculosis. Patients mostly present with a mass or a draining fistula in the neck. In such patients, tuberculosis must be kept in mind in the differential diagnosis of a cervical mass.[3] For diagnosing the disease, a complete physical examination, and laboratory and radiological investigations are necessary.

On physical examination, either a neck mass or a fistula or both can be seen. It was postulated that the supraclavicular region was the predominant site for the cervical lumps.[4] But in this series, posterior cervical and supraclavicular triangles were the most common sites for the lumps, and the submandibular region, which is in close proximity to the oral cavity, was the frequent site of involvement especially in atypical cases.

Ultrasonography, MR or CT scans clearly delineated the exact location and extent of MCL. On ultrasonography, multiple hypoechoic cystic masses with a surrounding thick capsule were detected. On MR, as MCL core became necrotic, its T_1 and T_2 relaxation times lengthened. Hence, on T_1-weighted images the central contents became of low signal intensity, while on T_2-weighted images they appeared to be high signal intensity. In contrast to the hypointense centre, the MCL rim appeared as isointense as surrounding muscles in both T_1- (Figure 4) and T_2 weighted-images. After administration of contrast, the MCL capsule enhanced on T_1-weighted images (Figure 5).

It is important to identify the type of the tuberculosis infection as mycobacterial or atypical tuberculous infection. PPD-S or T and PPD-B or NTM tests can be used for identification of mycobacterial and atypical tuberculous infections, respectively.[5] We could only perform the standard PPD test as the PPD-NTM test was not available.

The clinical presentation of TCL and ACL differ. TCL is mostly a local manifestation of a systemic disease which presents with constitutional symptoms (fever, weight loss, fatigue, etc.). Frequently, there is a history of previous tuberculous infection or contact. Neck masses are usually located in the posterior cervical and supraclavicular regions in a bilateral or multiple fashion, and the rate of fistula formation is relatively high. In the majority, a positive PPD test can be obtained.

ACL is a localized disease with rare constitutional symptoms. In general, the PPD test is negative or intermediate and a history of tuberculous contact is lacking. The disease presents with a unilateral or singular cervical lump located in the submandibular or preauricular regions. Fistula formation is infrequent.[6]

The portal of entry for atypical mycobacterium is supposed to be the oral mucosa and in particular the gingiva. This is especially true for the childhood neck masses of mycobacterial origin, deciduous teeth may harbour the nontuberculous mycobacterium and the microorganism may reach the neck sites around the mandible through the lymphatics. Therefore, we can speculate that the presence of deciduous teeth is a risk factor for ACL, and, in conjunction with other well-known conventional precautions, oral hygiene is important in order to prevent ACL.

The definitive diagnosis and subtyping of the mycobacterial infection are made on the basis of histopathological and microbiological assessments. However, isolation and subtyping of the mycobacterium takes time and it is not always possible to culture the mycobacterium. Conventional techniques for isolation and identification of mycobacteria take a long time to result and this can cause a delay in the initiation of treatment. Recent techniques, especially those that are based on molecular diagnosis, can facilitate early diagnosis and subtyping the mycobacteria. However, these techniques are still not routine practice and we did not have such facilities. The success rate of isolating the mycobacterium with conventional culturing method varied from 10 per cent to 69 per cent.[7] For this reason, histopathological diagnosis still has great importance for the commencement of treatment.[8,9] Therefore, we initiated post-operative anti-tuberculous drug treatment according to the result of histopathological examination that disclosed the diagnosis of tuberculous infection in a short period of time. Caseating necrosis or granulomatous inflammation is a common finding in pathological evaluation of the surgically excised materials.[10]

Management of mycobacterial adenitis necessitates both medical and surgical treatments. Standard anti-tuberculous drugs are used for the medical treatment. Their effectiveness in the treatment of tuberculous infection is well established in contrast to non-tuberculous infection which is supposedly resistant to the medications.[11,12] Bailey divided the causative agents of non-tuberculous infection into two groups with respect to their drug resistance.[13] The first group which is easy to treat included *M kansasii*, *M xenopi*, *M szulgai*, *M marinum*, *M ulcerans*. The second group consists of *M avium-intracellular*, *M scrofulacerum*, *M simiae*, *M chelonei*, *M fortuitum* which are difficult to treat. However, we prefer medical treatment for both tuberculous and non-tuberculous mycobacterial infections. The time recommended to initiate the medical treatment should be just after the histopathological diagnosis.

Surgical treatment includes either total excision of a single mass or selective nodal dissection in the presence of multiple lumps.[14] Sometimes curettage can be preferred when a skin necrosis or fluctuation or proximity of the lesion to the facial nerve or cervical accessory nerve or their branches is encountered. Removal of some skin may be necessary when there is a draining cutaneous fistula. An important characteristic which we observed during the operations, is the presence of dilated lymphatic channels around the adenitis. This condition may be suggestive for tuberculosis, and care should be taken to secure the lymphatics in order to prevent the formation of post-operative chylous fistula. Surgery is particularly important for treating ACL since they are considered drug resistant. In such cases, total excision or selective dissection of the cervical adenitis is mandatory. Selective nodal dissection is also recommended for unilateral and singular adenitis or for the lesions in submandibular and preauricular regions as well as for paediatric patients.

What would be the strategy when a pregnant woman had a mycobacterial cervical adenitis where the antituberculosis drugs are not recommended due possibly to their teratogenic effects? In this case, medical treatment should be delayed until the end of the pregnancy. During pregnancy, however, surgical excision of the cervical lump can be made unless there is a contra-indication. The recommended time would be the second or third trimester of the pregnancy. If an abscess formation is encountered, local care with frequent puncturing or aspiration and compressive dressing should be carried out.

In conclusion, tuberculosis is a systemic disease and cervical tuberculosis is a local manifestation of the disease. Histopathology is a useful diagnostic tool. Anti-tuberculous chemotherapy is the essential treatment of cervical tuberculosis. In TCL, the biopsy of the neck lump should be excisional rather than incisional, because the latter can give rise to chronic drainage from the biopsy site. However, ACL usually manifests by a primary cervical disease, and in general is resistant to medical treatment. Therefore, total surgical excision and selective nodal dissection is the preferred treatment in ACL. Consequently, utilizing both combined medical and surgical treatment options, both tuberculous and non-tuberculous cervical adenitis can be treated successfully. Furthermore, neither a treatment failure nor recurrence of the disease has been encountered in our experience even when ACL is concerned. The results of our treatment protocol have been good.

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