TUBERCULOUS CERVICAL LYMPHADENOPATHY AND THE ROLE OF SURGICAL TREATMENT

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Abstract. The relationship between the size of a lymph node in tuberculous cervical lymphadenopathy (TCL) cases and the role of surgery is unclear. We examined the outcomes in patients with TCL treated between October 2011 and November 2013 at the ENT Department, Hatyai Hospital. Ninety-seven patients were included in the study. The subjects were divided into five groups based on clinical presentation and anatomical site of the involved lymph nodes: 1) solitary lymph node (n=36), 2) multiple lymph nodes at one anatomical site (n=31), 3) lymph nodes at multiple anatomical sites (n=16), 4) patients with lymph node abscesses (n=12), and 5) patients with fistulas (n=2). Of the 36 solitary lymph node cases, 14 had a lymph node ≥3 cm in diameter. Eight of the 14 had complete surgical excision of the node before receiving a full course of medication and all did well. Six of the 14 who were treated with drug therapy alone had problems: 2 progressed to abscess formation and 4 had residual enlargement of their lymph nodes that required surgery. The cure rates differed significantly by type of treatment (p<0.001). Of the 47 cases with multiple cervical lymph nodes ≥3 cm in diameter, 13 were treated with medication alone; 9 (69%) did well and 4 developed an abscess and had residual lymphadenopathy. All 34 cases treated with modified neck dissection before a full course of medication were cured. The cure rates differed significantly by type of treatment (p=0.004). These results suggest surgical treatment for all accessible lymph nodes ≥3 cm in diameter in patients with TCL prior to a full course of drug therapy significantly increases the cure rate compared to medication alone.

Keywords: tuberculous cervical lymphadenopathy, surgical treatment

INTRODUCTION

Tuberculosis (TB) is a granulomatous inflammatory disease caused by *Mycobacterium tuberculosis* (human or bovine type). One-third of the world's population has been infected by TB (Ibekwe *et al*, 1997). Seventy-five percent of the TB in developing countries is in the economically productive age between 15 and 50 years (Harries *et al*, 1998).

Tubercular lymphadenopathy is the most common extra-pulmonary form of TB and commonly affects cervical lymph nodes, especially in immunocompromised patients, particularly those with HIV infection (Dandapat *et al*, 1990; WHO, 2003). It is important for otolaryngologists to be aware of TB in the head and neck region and its various manifestations. Fine needle aspiration cytology (FNAC)

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is widely accepted as an accurate, sensitive, specific and cost-effective procedure to diagnose lymphadenopathy. FNAC is easy to perform and has minimal complications (Pandit *et al*, 1987).

The regimen currently recommended by the World Health Organization (WHO) for the treatment of new cases of TB (Regimen I) is: isoniazid (H), rifampicin (R), pyrazinamide, and ethambutol for the first 2 months followed by H and R for an additional 4 months (WHO, 2009). Multidrug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB) are increasing worldwide (WHO, 2009). The WHO recommends performing drug susceptibility testing at the commencement of therapy, especially among previously treated patients (WHO, 2009).

Hatyai Hospital is a referral medical center for southern Thailand with about 906,000 cases per year and 55,000 admissions per year. Our ENT department serves about 35,000 OPD cases per year and has 700 admissions per year. Seven otolaryngologists taking care of patients with tuberculous cervical lymphadenopathy (TCL) perform about 2,300 surgical procedures per year, including incisional biopsies, excisions, incision and drainage, and neck dissection. Surgery with drug therapy or drug therapy alone has been tried with varying results. This study assessed the results of various types of treatment for TCL, including the presence of large lymph nodes, fistula or abscess formation as predictors of outcome.

MATERIALS AND METHODS

Ninety-seven consecutive patients with the diagnosis of TCL treated in our department from October 2011 to November 2013 were reviewed. The following data were collected: age, sex, size of lymph nodes at presentation and site of involvement, HIV results and chest x-ray findings. All patients underwent an ENT examination and were sent for FNAC. Cytological findings of granulomas, caseation necrosis, presence of acid-fast bacilli (AFB) or a positive culture for TB were considered as positive findings. Those with FNAC findings suggestive of reactive lymphadenitis were treated with 10 days of antibiotic therapy. Those that did not respond to antibiotic therapy were biopsied to confirm the histopathology. Those patients with confirmed cytological or histopathological tubercular lymphadenitis were referred to the Directly Observed Treatment (DOT) clinic for antitubercular therapy (ATT). All new cases were treated with WHO regimen I.

Total excision and modified neck dissection were done under general anesthesia for solitary or multiple cervical lymph nodes at one anatomic site, for nodes greater than 3 cm in diameter or for lymph nodes at multiple anatomic sites prior to ATT. For small abscesses, surgical treatment comprised excision of the abscess wall along with the adjacent structures or fistulas and the wounds were primarily closed. For large abscesses, incision was done and the wounds were left open for drainage. All patients were followed-up monthly to evaluate the response to ATT. Patients with residual lymph node enlargement after the full course of medication were treated with excision or modified neck dissection. Those with persistent wound discharge, new abscesses or disease relapse were investigated for MDR-TB and treated accordingly.

In this study, we defined "cure" as complete disappearance of the cervical lymph nodes or no abscess formation after the full course of ATT and follow-up for at least 6 months after ATT.

Table 1
Baseline characteristics of 97 patients with tuberculous cervical lymphadenopathy.

Characteristics	Number (%)
Gender	
Male	45 (46.3%)
Female	52 (53.7%)
Age (years)	
<20	7 (7.2%)
20-40	65 (67.0%)
41-60	23 (23.7%)
>60	2 (2.1%)
HIV status	
Sero-positive	34 (35.1%)
Sero-negative	63 (64.9%)
Characteristics of cervical lymph nodes	
Solitary lymph node	36 (37.1%)
<3 cm, treated with medication only	22 (22.6%)
≥3 cm	14 (14.4%)
Treated with medication only	6 (6.2%)
Treated with surgery and medication	8 (8.2%)
Multiple lymph nodes at one anatomical site	31 (31.9%)
≥3 cm, treated with medication only	13 (13.3%)
≥3 cm, treated with surgery and medication	18 (18.5%)
Lymph nodes at multiple anatomical sites ≥3 cm, treated with surgery and medication	16 (16.4%)
Abscess	12 (12.3%)
<3 cm, treated with excision and medication	2 (2.0%)
≥3 cm, treated with incision/drainage and medication	10 (10.3%)
Fistula <3 cm, treated with excision and medication	2 (2.1%)

RESULTS

Between October 2011 and November 2013, 97 cases were diagnosed with TCL at Hatyai Hospital. Most (54%) were female, aged 20-40 years (67%) and HIV negative (65%) (Table 1).

Patients were divided into five groups by their clinical characteristics and sites involved (Siu *et al*, 1983): 1) solitary lymph node, 2) multiple lymph nodes at one anatomical site, 3) multiple anatomical sites, 4) tuberculous abscess, and 5) tuberculous fistula. The results of the treatments are shown in Table 2.

Of the 36 patients with solitary lymph node enlargement, 22 had a lymph node <3 cm in diameter and 14 had a lymph node ≥3 cm in diameter. Of the 22 patients with a lymph node <3 cm in diameter, 17 were diagnosed as having tuberculous lymphadenitis by FNAC and the others were diagnosed by excisional biopsy. Of the 22 patients who finished the full course of drug treatment, 19 were cured and 3 were not cured (2 small residual lymph nodes and 1 abscess formation). Of the 14 patients with a lymph node ≥3 cm in diameter, all were diagnosed by FNAC. Of the 6 patients treated with medication

Table 2
Results of treatment.

Characteristics of cervical lymph node(s)	Size of node (number of patients)	Diagnostic method and treatment	Cured *n* (%)	Not cured *n* (%)	*p*-value[a]
Solitary	<3 cm (*n*=22)	FNA + medication	15 (88.2)	2 (11.8)	1.000
		Biopsy + medication	4 (80.0)	1 (20.0)	
	≥3 cm (*n*=14)	FNA + medication	0 (0)	6 (100)	<0.001
		FNA + surgery (excision) + medication	8 (100)	0 (0)	
Multiple at one site or	>3 cm (*n*=13)[b]	FNA + medication	9 (69.2)	4 (30.8)	0.004
at multiple sites	≥3 cm (*n*=34)[c]	FNA + surgery (modified neck dissection) + medication	34 (100)	0 (0)	
Abscess	<3 cm (*n*=2)	Excision + medication	2 (100)	0 (0)	-
	>3 cm (*n*=10)	Incision and drainage + medication	4 (40)	6 (60)	-
Fistula	<3 cm (*n*=2)	Excision + medication	2 (100)	0 (0)	-

[a]2-sided Fisher exact test.
[b]All at one anatomical site; [c]18 at one anatomical site, 16 at multiple anatomical sites.

only 2 developed an abscess and 4 had residual enlargement of their lymph nodes. Subsequent surgery showed histological evidence of reactive lymphadenitis. All 8 patients treated with excision followed by medication had good results. The group treated surgically had a significantly better outcome ($p<0.001$).

All 31 patients with multiple lymph nodes confined to one anatomic site had lymph node(s) ≥3 cm in diameter. Of the 13 patients treated with medication only, 9 were cured and 4 were not cured (1 with abscess formation and 3 with residual lymph node enlargement). All 18 patients diagnosed with FNAC were cured using modified neck dissection surgery prior to a full course of ATT.

Sixteen patients had lymphadenopathy at multiple anatomic sites, *eg*, bilateral neck involvement. All were treated with modified neck dissection to remove the grossly involved lymph nodes and then given a full course of ATT. All wounds healed well without further lymphadenopathy.

Of the 12 patients with an abscess, 10 had an abscess ≥3 cm in diameter and 2 had an abscess <3 cm in diameter. Of the 10 patients treated with incision/drainage and ATT, 4 had no persistent discharge from the wounds while 6 (including 2 patients with MDR-TB) had persistent discharge requiring excision of the lesions. Two patients with an abscess <3 cm in diameter were treated with excision of the abscess cavity and the wound was then closed primarily. These patients recovered well from the surgery and had no subsequent problems after a full course of ATT.

Two patients who presented with a tuberculous fistula and a lymph node <3 cm were treated by excision of the tract and the involved underlying lymph

nodes. The wounds eventually healed after thorough extirpation of the involved tissue and a full course of drug treatment but the residual scarring was rather unsightly.

DISCUSSION

The most common manifestation of mycobacterial infection encountered in otolaryngological practice is cervical lymphadenopathy (Munck and Mandpc, 2003). A higher proportion of the patients are females (Polakova, 1993; Dvorski, 1989). TCL is not a life-threatening problem, but does require treatment by physicians and surgeons. The majority of patients tend to be young, healthy, working adults without constitutional symptoms. However, lymphadenopathy can progress to abscess formation and fistula formation, which can be disabling and socially unacceptable. Physical and laboratory findings may be inconsistent or unreliable. They can mimic other pathologic processes which may be treated with either surgery or medication (Kanlikama *et al*, 2000).

ATT under DOTS is the main treatment while surgery is required for enlarged lymph nodes or TCL which does not regress with medication (Castro *et al*, 1985). Our findings were similar to other studies (Pandit *et al*, 1987; Weiler *et al*, 2000). Our results showed that patients with large lymph nodes (≥3 cm) should be treated with surgery prior to medication. Without early treatment by surgical removal, the grossly involved lymph nodes may form an abscess which can be challenging to manage surgically. Incision and drainage is inadequate and further surgery may be necessary to excise the residual infected tissue (Siu *et al*, 1983). To save the patient a second operation and a prolonged convalescent period, primary modified neck dissection may be the method of choice for cervical lymph nodes ≥3 cm in diameter. The cure rates differed significantly for TCL between those treated with medication alone versus those treated with surgery prior to medication.

One limitation of the current study was not consistently using the gold standard for diagnosing TB by a positive culture for *M. tuberculosis* or positive biopsy results. We used the standard procedures available in our hospital which are clinical presentation, AFB smear, and lack of response to non-antimycobacterial antibiotics. There is the possibility of other non-tuberculous mycobacteria (NTM) contamination because Thailand has a relatively high rate of NTM cervical lymphadenitis cases and many NTM cases require treatment for a year or longer, whereas our study treated them with a short course of 6 months. After some cases were treated, they still needed surgery.

In conclusion, our experience with the role of surgical treatment of tuberculous cervical lymphadenopathy shows that total excision of lymph nodes ≥3 cm in diameter, modified neck dissection of multiple enlarged cervical lymph nodes at one site and at multiple anatomic sites, and excision of small tuberculous abscesses can be done safely as a primary procedure. Surgery prior to drug therapy for TCL gave good results.

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REFERENCES

Castro DJ, Hoover L, Zuckerbraun L. Cervical mycobacterial lymphadenitis medical vs surgical management. *Arch Otolaryngol* 1985; 111: 816-9.

Dandapat MC, Mishra BM, Dash SP, Kar PK. Peripheral lymph node tuberculosis: a review of 80 cases. *Br J Surg* 1990 Aug; 77: 911-2.

Dvorski I. Tuberculosis of the cervical lymph nodes. *Plucne Bolesti* (Yugoslavia) 1989; 4: 69-71.

Harries A, Maher D, Uplekar M, Raviglione M. Tuberculosis manual for Nepal, National tuberculosis programme. Kathmandu: Ministry of Health, Government of Nepal, Oct 1998.

Ibekwe AO, al Shareef Z, al Kindy S. Diagnostic problems of tuberculous cervical lymphadenitis (Scrofa). *Am J Otolaryngol* 1997; 18: 202-5.

Kanlikama M, Mumbuc S, Bayazit Y, Sirikci A. Management strategy of mycobacterial cervical lymphadenitis. *J Laryngolotol* 2000; 114: 274-8.

Munck K, Mandpc AH. Mycobacterial infections of the head and neck. *Otolaryngol Clin North Am* 2003; 36: 569-76.

Pandit AA, Candes FP, Khubchandoni SR. Fine needle aspiration cytology of lymph nodes. *J Prostgrad Med* 1987; 33: 134.

Polakova K. Tuberculosis lymphadenitis, the most frequent symptoms of extrapulmonary tuberculosis. *BratislLekListy* (Slovakia) 1993; 94: 504-6.

Siu KF, Ng A, Wong A. Tuberculosis lymphadenopathy: A review of results of surgical treatment. *Aust NZ J Surg* 1983; 53: 253-7.

Weiler Z, Nelly P. Baruchin AM, Oren S. Diagnosis and treatment of cervical tuberculous lymphadenitis. *J Oral Maxillofac Surg* 2000; 58: 477-81.

World Health Organization (WHO). Treatment of tuberculosis: guidelines for national programmes. 4th ed. Geneva: WHO, 2003. [Cited 2010 Nov. 23]. Available from: URL: http://www.who.int/tb/publications/cdstb 2003; 313/en/

World Health Organization (WHO). Treatment of tuberculosis guidelines. 4th ed. Geneva: WHO, 2009. [Cited 2010 Nov 23]. Available from: URL: http://www.who.int/tb/publications/cds_tb_2003_313/en/