

CASE REPORT

FATAL PERIPHERAL T-CELL LYMPHOMA FOLLOWING INTRAMUSCULAR TUBERCULOSIS OF THE FOREARM

Taweechok Wisanuyotin¹, Winai Sirichativapee¹, Chat Sumnanoont¹,
Permsak Paholpak¹, Supinda Koonmee², Pat Laupattarakasem¹,
Prathana Chowchuen³ and Weerachai Kosuwan¹

¹Department of Orthopedics, ²Department of Pathology, ³Department of Radiology,
Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Abstract. Intramuscular tuberculosis (TB) is a rare disease, and lymphoma may occur following a bout of TB. We report on an unusual presentation of peripheral T-cell lymphoma that occurred after an infiltrative lesion of intramuscular TB of the forearm in an immunocompetent host. To our knowledge, this is the first case where TB of a muscle presenting as an infiltrative lesion instead of an abscess developed into peripheral T-cell lymphoma.

Keywords: forearm, intramuscular, T-cell lymphoma, tuberculosis

INTRODUCTION

Tuberculosis (TB) is a worldwide health problem. The World Health Organization (WHO) estimated that there were 8.6 million new cases of TB in 2012 alone, and that 1.3 million people had died from the disease (WHO, 2013). Musculoskeletal TB is rare, occurring in 1% to 3% of all infected patients (Farer *et al*, 1979). The more common presentations of musculoskeletal TB include: bones and joints, muscles, tenosynovium and bursa. Among these, primary TB of a muscle is the rarest form (Wang *et al*, 2003; Sen *et al*, 2011) and usually presents as a cold abscess (Wang *et al*, 2003; Trikha *et al*, 2006).

Correspondence: Dr Taweechok Wisanuyotin,
Department of Orthopedics, Faculty of Medicine,
Khon Kaen University, Khon Kaen 40002,
Thailand.

Tel: +66 (0) 43 348398; Fax: +66 (0) 43 348398
E-mail: taweechok@yahoo.com

Non-Hodgkin's lymphoma (NHL) may be preceded by chronic inflammation: the risk reportedly increases in persons with a history of TB (Tavani *et al*, 2000). Herein, we report on an unusual case in which intramuscular TB of the forearm at the first diagnosis developed into peripheral T-cell lymphoma. To our knowledge, this is the first case report of intramuscular TB presenting as an infiltrative lesion instead of an abscess that developed into peripheral T-cell lymphoma.

CASE REPORT

A 43-year-old Asian male truck driver presented at Srinagarind Hospital, Khon Kaen, Thailand with chronic swelling of the right forearm that had been present for 2 years. He had no underlying disease and denied having any trauma, fever or weight loss, but had noticed that his right forearm had slowly enlarged, although



Fig 1—The patient's right forearm revealed generalized swelling with superficial vein dilatation.

there was no pain or numbness. On physical examination, the patient was afebrile and well-nourished. The right forearm revealed generalized swelling with superficial vein dilatation (Fig 1). There was no tenderness or warmth on palpation. Other examinations were normal.

The complete blood count, erythrocyte sedimentation rate and other blood chemistry tests were unremarkable. The blood test for human immunodeficiency virus using ELISA was negative. Plain radiographs of the right forearm showed only soft tissue swelling, and a chest x-ray revealed no abnormalities. A magnetic resonance imaging (MRI) of the right forearm showed diffusely enlarged muscles, with intermediate signal intensity on the T1-weighted image. The lesions had infiltrated along the intramuscular plane, involving the entire flexor digitorum, extensor carpi radialis and pronator teres muscles, and exhibited heterogeneously intermediate to hyperintense signal intensity within these muscles on the T2-weighted image. Inhomogeneous

enhancement of these muscles was observed on the T1-weighted image after intravenous gadolinium administration. No intramedullary or cortical bone invasion was detected (Fig 2). An incisional biopsy was ordered. Several pieces of soft tissue without evidence of pus were sent for pathological examination. Microscopically, the lesion revealed chronic granulomatous inflammation with multinucleated giant cells (Fig 3), but the Ziehl-Neelsen stain for acid-fast bacilli was negative.

The tissue culture, however, confirmed *Mycobacterium tuberculosis*, so four-drug anti-tuberculosis treatment (isoniazid, rifampin, pyrazinamide and ethambutol) was administered for 12 months.

At the end of the 12-month therapy, the right forearm was slightly decreased in size; but the patient developed progressive weakness of the right forearm as well as right claw hand deformity. At this stage, electromyography was performed, which revealed inflammatory myopathy and ulnar neuropathy of the wrist joint. The patient also developed progressive enlargement of the cervical, epitrochlear, axillary and groin lymph nodes. A biopsy of the cervical lymph nodes revealed chronic inflammation with fibrosis. Three weeks after the biopsy, the patient was admitted to the hospital because of dyspnea and fever. The septic workup showed para-pneumonic effusion of the left lung, so empirical antibiotic therapy (ceftazidime) was administered intravenously; however, the clinical picture did

PERIPHERAL T-CELL LYMPHOMA FOLLOWING INTRAMUSCULAR TB

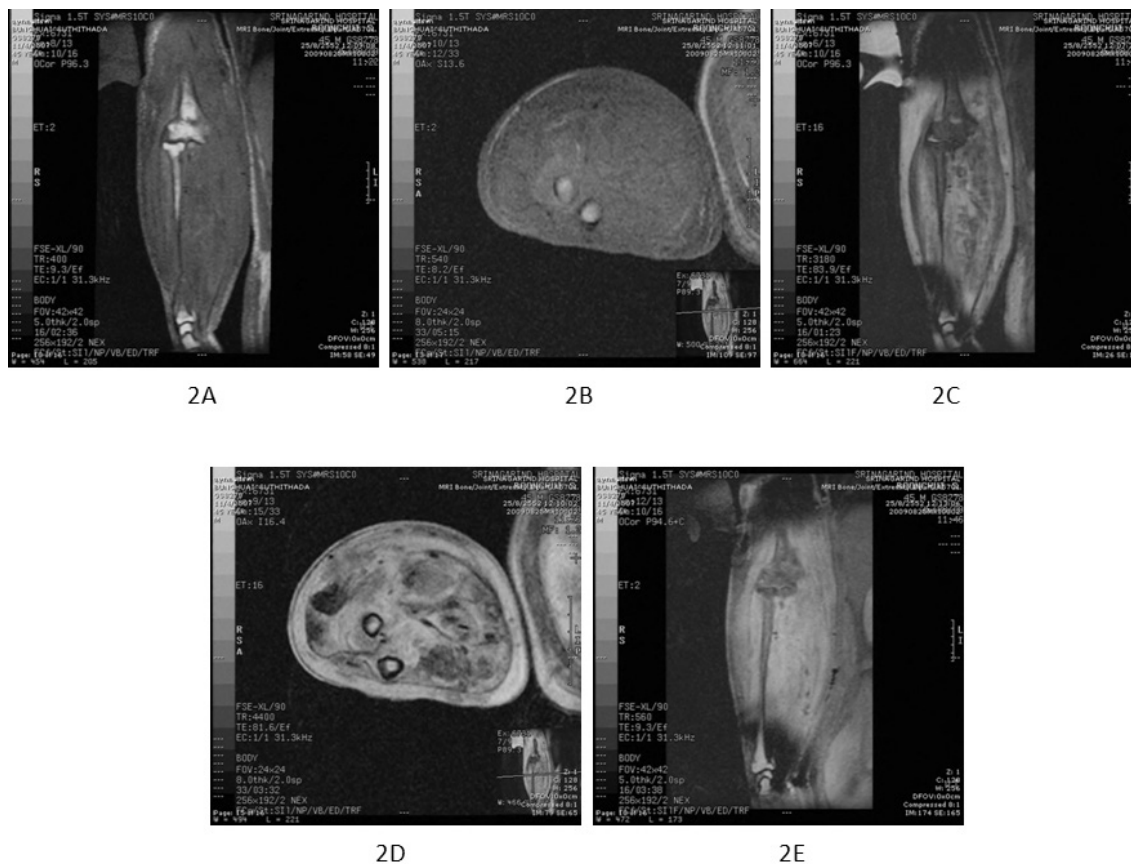


Fig 2–MRI of the right forearm: (A) coronal T1-weighted and (B) axial T1-weighted MR images show diffuse enlarged muscles of the forearm with intermediate signal intensity lesions infiltrating along the intramuscular plane, involving the entire flexor digitorum, extensor carpi radialis and pronator teres muscles; (C) coronal T2-weighted and (D) axial T2-weighted MR images show heterogeneously intermediate to hyperintense signal intensity within muscles of the forearm; (E) gadolinium-enhanced coronal T1-weighted MR image shows inhomogeneous enhancement of forearm muscles.

not improve. The patient died three weeks after admission due to severe respiratory distress, severe metabolic acidosis, and disseminated intravascular coagulation.

Generalized lymphadenopathy of the right subclavian and para-aortic nodes was found during the autopsy. Microscopic examination revealed peripheral T-cell lymphoma infiltrating the right subclavian and para-aortic lymph nodes, lung parenchyma, right adrenal gland and

right forearm muscles (Fig 4). Peripheral T-cell lymphoma not otherwise specified (PTCL-NOS) was diagnosed based on exclusion of other types of T-cell lymphomas and features of the immunohistochemical study, which were positive for CD4, focally positive for CD30 but negative for CD8.

The study protocol was approved by the Ethics Committee for Human Research, Khon Kaen University, Khon Kaen, Thailand (HE521065).

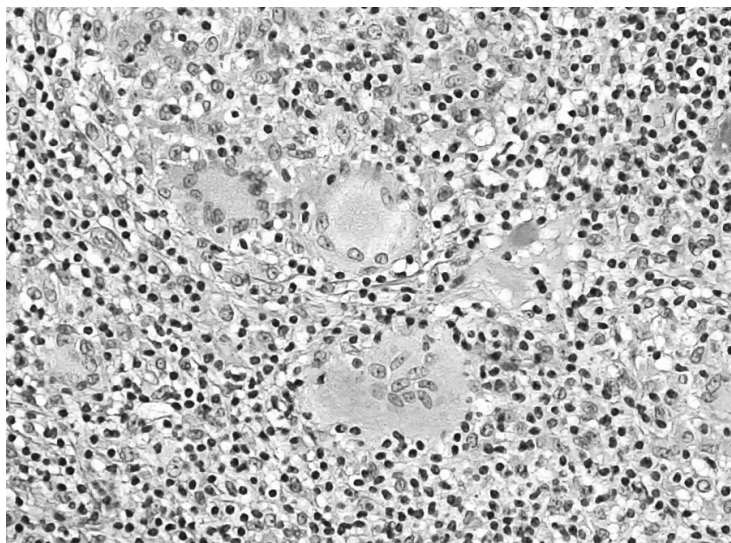


Fig 3—Photomicrograph showing the typical appearance of giant cells in TB with peripherally arranged nuclei—so-called Langerhans giant cells. (Hematoxylin & eosin, 40×).

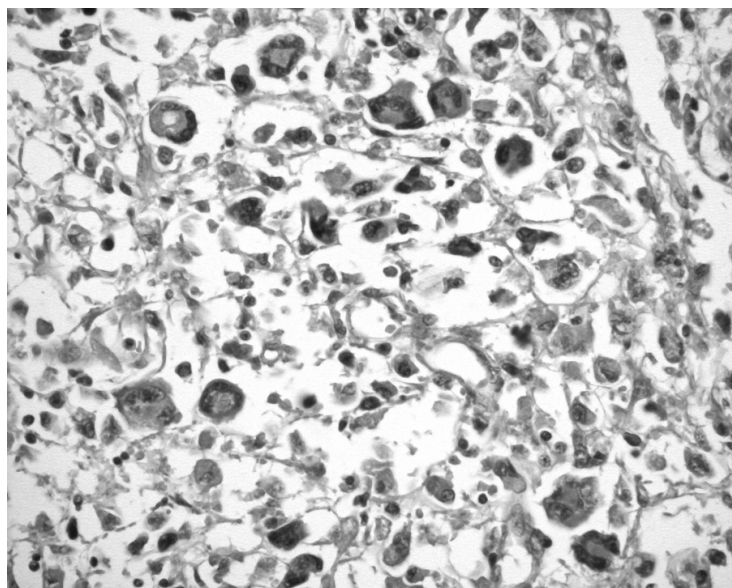


Fig 4—Photomicrograph of muscle biopsy (from the same muscle as shown in Fig 3) showing discohesive large pleomorphic cells with multinucleated (including wreath-like and horse-shoe-shaped) nuclei, prominent nucleoli, and a moderate amount of eosinophilic cytoplasm admixed with small-sized lymphocytes, plasma cells and histiocytes. (Hematoxylin & eosin, 40×).

DISCUSSION

Intramuscular TB without bone involvement is rare (Abdelwahab *et al*, 1998; Trikha *et al*, 2006) because of the rich blood supply, the high levels of lactic acid in muscles, the absence of reticuloendothelial or lymphatic tissue and the highly differentiated state of muscle tissue (Plummer *et al*, 1934). Muscular involvement by TB is, therefore, usually by direct extension from an adjacent bone, as is frequently found in tuberculous spondylitis (Chapman *et al*, 1979). Moreover, TB usually involves only one muscle (Abdelwahab *et al*, 1998; Sen *et al*, 2011), although occasionally it occurs in several muscles (Derkash and Makley, 1979) as in our patient.

The classic clinical presentation of intramuscular TB is an abscess (pyomyositis) with symptoms and signs including fever, swollen mass, weight loss, loss of appetite, and/or night sweats (Sen *et al*, 2011).

Classic MRI features of intramuscular TB include an intramuscular abscess with a low or intermediate signal intensity on the T1-weighted images and a high signal intensity on the T2-weighted images in muscle. Peripheral rim

enhancement after gadolinium infusion has been found (Al-Najar *et al*, 2010). By contrast, the MRI findings in this case included intermediate signal intensity on both the T1- and T2-weighted images in all of the muscles of the forearm, and inhomogeneous enhancement of these muscles after intravenous administration of gadolinium. Our findings were non-specific, and many conditions can produce similar changes in muscle signal intensity, including rhabdomyolysis, vascular insults (*ie*, compartment syndrome, diabetic infarction), myositis (*ie*, autoimmune, idiopathic, sarcoid myopathy, infectious processes), subacute denervation and radiation therapy (Theodorou *et al*, 2012).

Tuberculosis usually occurs in an immunocompromised host, although there are also reports from immunocompetent hosts, especially in an endemic area (Abdelwahab *et al*, 1998; Trikha *et al*, 2006). The diagnosis of intramuscular TB in our patient was established by tissue pathology and culture. Concomitant pulmonary TB was not found; therefore, primary TB of the muscle was established.

Treatment of intramuscular TB in the presence of an abscess is surgical drainage plus anti-TB drugs (Abdelwahab and Kenan, 1998), but an abscess was not found in our patient so surgical drainage was not indicated and only anti-TB drugs were given.

It is well documented that chronic inflammation and infection can be related to an occurrence of lymphoma (Tavani *et al*, 2000; Askling and Ekblom, 2001; Smedby *et al*, 2008) and that TB is one of the chronic infectious diseases known to increase the risk of non-Hodgkin's lymphoma (NHL) (Askling and Ekblom, 2001). The coexistence of TB and NHL has been reported, but no evidence to date has demonstrated

that TB is a cause of NHL (Centkowski *et al*, 2005; Audebert *et al*, 2006). In our patient, therefore, the possibility of the coexistence of TB and NHL should not be discarded, as the NHL may have been present at the initial diagnosis, albeit undiscovered.

T-cell NHL accounts for 10% to 15% of all NHL cases, and PTCL-NOS is the most common subtype. Its clinical course is aggressive, so patients with PTCL-NOS usually present with widespread disease (Armitage, 2012). In our patient, PTCL-NOS was found during the autopsy in the lung, right adrenal gland, right subclavian lymph node, superior vena cava lymph node, para-aortic lymph node and muscles of the right forearm. Generally, the treatment of PTCL-NOS is chemotherapy with a regimen of cyclophosphamide, doxorubicin, vincristine and prednisolone (CHOP) plus etoposide (Armitage, 2012).

ACKNOWLEDGEMENTS

The authors thank the patient and his family; the Departments of Orthopedics, Radiology and Pathology, and the Faculty of Medicine, Khon Kaen University, for their support; and Mr Bryan Roderick Hamman for assistance with the English language presentation. We would like to acknowledge Christopher C Salisbury for editing the manuscript via Publication Clinic KKU, Thailand

REFERENCES

- Abdelwahab IF, Kenan S, Hermann G, Klein MJ. Tuberculous gluteal abscess without bone involvement. *Skeletal Radiol* 1998; 27: 36-9.
- Abdelwahab IF, Kenan S. Tuberculous abscess of the brachialis and biceps brachii muscles without osseous involvement. A case report. *J Bone Joint Surg Am* 1998; 80: 1521-4.

- Al-Najar M, Obeidat F, Ajlouni J, Mithqal A, Hadidy A. Primary extensive pyomyositis in an immunocompetent patient: case report and literature review. *Clin Rheumatol* 2010; 29: 1469-72.
- Armitage JO. The aggressive peripheral T-cell lymphomas: 2012 update on diagnosis, risk stratification, and management. *Am J Hematol* 2012; 87: 511-9.
- Askling J, Ekblom A. Risk of non-Hodgkin's lymphoma following tuberculosis. *Br J Cancer* 2001; 84: 113-5.
- Audebert F, Schneidewind A, Hartmann P, Kullmann F, Schölmerich J. Lymph node tuberculosis as primary manifestation of Hodgkin's disease. *Med Klin (Munich)* 2006; 101: 500-4.
- Centkowski P, Sawczuk-Chabin J, Prochorec M, Warzocha K. Hodgkin's lymphoma and tuberculosis coexistence in cervical lymph nodes. *Leuk Lymphoma* 2005; 46: 471-5.
- Chapman M, Murray RO, Stoker DJ. Tuberculosis of the bones and joints. *Semin Roentgenol* 1979; 14: 266-82.
- Derkash RS, Makley JT. Isolated tuberculosis of the triceps muscle. Case report. *J Bone Joint Surg Am* 1979; 61: 948.
- Farer LS, Lowell AM, Meador MP. Extrapulmonary tuberculosis in the United States. *Am J Epidemiol* 1979; 109: 205-17.
- Plummer WW, Sanes S, Smith WS. Skeletal muscle tuberculosis. *J Bone Joint Surg Am* 1934; 16: 632.
- Sen RK, Tripathy SK, Deivaraju C, Das A. Isolated focal pyomyositis of teres minor: an unusual presentation of tuberculosis. *Acta Orthop Traumatol Turc* 2011; 45: 276-9.
- Smedby KE, Askling J, Mariette X, Baecklund E. Autoimmune and inflammatory disorders and risk of malignant lymphomas – an update. *J Intern Med* 2008; 264: 514-27.
- Tavani A, La Vecchia C, Franceschi S, Serraino D, Carbone A. Medical history and risk of Hodgkin's and non-Hodgkin's lymphomas. *Eur J Cancer Prev* 2000; 9: 59-64.
- Theodorou DJ, Theodorou SJ, Kakitsubata Y. Skeletal muscle disease: patterns of MRI appearances. *Br J Radiol* 2012; 85: 1298-308.
- Trikha V, Varshney MK, Rastogi S. Isolated tuberculosis of the vastus lateralis muscle: a case report. *Scand J Infect Dis* 2006; 38: 304-6.
- Wang JY, Lee LN, Hsueh PR, et al. Tuberculous myositis: a rare but existing clinical entity. *Rheumatology (Oxford)* 2003; 42: 836-40.
- World Health Organization (WHO). Global tuberculosis report 2013. Geneva: WHO, 2013. [Cited 2014 Jun 23]. Available from: URL: http://www.who.int/tb/publications/global_report/en/