Reminder of important clinical lesson

Primary inoculation skin tuberculosis by accidental needle stick

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A 42-year-old female laboratory worker presented with a left index finger skin lesion after an accidental prick while handling samples of a cultural exam of *Mycobacterium tuberculosis*. Surgical excision was performed and pathology analysis revealed a dermic chronic inflammatory process with no granulomas. Later, a non-painful lymphadenopathy appeared in the left axilla as well as brownish indurated skin lesions in the lower limbs consistent with erythema nodosum. Fine needle aspiration biopsy of the lymph node revealed epithelioid granulomas, Langhans' multinucleated giant cells and the presence of acid-fast bacilli. Standard tuberculosis treatment resulted in regression of lesions and no relapses occurred in the 2-year follow-up period.

BACKGROUND

Infection risk of laboratory personnel has long been recognised and has led to the elaboration of standards of practice to prevent them. Laboratory infections risk is estimated at 16.2/100 000 person-years, and generally full recovery can be achieved after treatment.¹ However, the increasing numbers of diseases like multiresistant tuberculosis (TB) and HIV infection, in which the available treatment is not fully effective, raises new public health concerns. TB remains an important risk for healthcare personnel since infections are higher among forensic and microbiology laboratory staff,² these occurrences being probably under-reported.³

Cutaneous TB is nowadays a rare disease in developed countries, occurring mainly in healthcare workers.³ It can present in various forms depending on the mechanism of propagation and the bacterial load implicated. We report a rare case of primary inoculation TB in a microbiology laboratory technician.

CASE PRESENTATION

The patient was a 42-year-old Caucasian woman, and her medical history included a glomerulopathy of unknown cause detected at the age of 18 and kidney stones. She was medicated with losartan 50 mg/day. She worked in a microbiology laboratory, handling biologic products with mycobacteria. She presented with a cutaneous lesion in the left index finger about 4 weeks after an accidental needle prick while transferring samples of a cultural exam of previously identified *Mycobacterium tuberculosis* complex (by molecular typing) to proceed to drug susceptibility testing. The lesion was roughly rounded, elevated, 3 mm in diameter, rugous and exhibited the same colour of the skin surrounding it. No pain or other inflammation signs were present and she had no other alterations at physical examination. Surgical excision of the lesion was performed and the resulting wound scarred normally within

a week. Pathology analysis of the tissue revealed a dermic chronic inflammatory process with lymphocytes and histiocytes in predominantly perivascular distribution. The epidermis showed reactive-type alterations. No granulomas were identified and no microbiological examination was performed.

A few days later, a non-painful lymphadenopathy appeared in the left axilla and she decided to consult a pulmonologist. At this time, the patient had no respiratory symptoms. Besides the palpable node, physical examination also revealed rounded, brownish indurated skin lesions in the anterior aspect of lower limbs bilaterally, consistent with erythema nodosum. No other adenopathies were found, namely in supraclavicular or cervical chains.

INVESTIGATIONS

Chest radiography and laboratory routine tests, including renal function were normal. Mantoux test showed a positive reaction with an induration of 17 mm in diameter. Ultrasonographic study revealed three enlarged nodes on the left axilla, the largest measuring 10 × 22 mm. Pathologic analysis of fine needle aspiration biopsy revealed epithelioid granulomas (figure 1) and Langhans multinucleated giant cells. Ziehl-Neelsen stain detected the presence of acid-fast bacilli.

TREATMENT

The patient was treated with weight-adjusted doses of isoniazid, rifampin, pyrazinamide and ethambutol, in the first 2 months and isoniazid plus rifampin thereafter.

OUTCOME AND FOLLOW-UP

Treatment was completed without any adverse effect, and with regression of the lesions. The patient was kept in follow-up for 2 years without any relapse.

Figure 1 (A) H&E×100. Smear of lymph node aspirate with epithelioid cell granulomas. (B) H&E×400. Magnification showing lymphocytes and activated macrophages (epithelioid cells).

DISCUSSION

Primary inoculation skin TB usually manifests as a papule or nodule that can be associated with a non-tender lymphadenopathy, producing a lymphocutaneous complex analogous to the Ghon complex.³ The first known description of cutaneous TB after direct inoculation was made by Renné Laennec in 1826. He depicted his own skin TB in the left forefinger after an accidental injury while performing a postmortem examination.⁴ TB infection in laboratories and necropsy rooms occurs mostly by inhalation of bacilli in aerosols, but also by contact with infected material. Since intact skin is an effective barrier against invasion of *M tuberculosis*, infection usually follows injuries with contaminated instruments.⁵ In a review by Semaan *et al* in 2008, 26 cases of cutaneous TB had been reported in English literature since 1935, including one acquired as an occupational hazard,⁶ but cutaneous TB may be resurging.⁷

In this case, lack of culture or molecular diagnostic techniques of the skin or lymph node biopsy may question the establishment of a definite TB case. Nevertheless, demonstration of acid-fast bacilli in the lymph node tissue, absence of previous TB history, typical histopathologic findings of lymph node specimens, conversion of tuberculin skin test, relationship with accidental prick with a needle contaminated with *M tuberculosis* and clinical course of the disease with resolution after specific treatment, strongly support the diagnosis of primary inoculation skin TB. The case is further enriched by the appearance of erythema nodosum which is seen almost exclusively in primary forms of TB.⁸

Mycobacteria, other than TB can be implicated in localised skin infections, most commonly rapidly growing mycobacteria and *Mycobacterium marinum*,⁹ the latter being more consistent with the described presentation in an immunocompetent person.¹⁰ However, lack of environmental exposure¹⁰ and the fact that the cutaneous lesion developed exactly in the same place of the needle prick, deems this hypothesis unlikely.

Lack of experience can be associated with increased risk for infection.¹¹ This case emphasises the importance of strict precautions regarding the handling of needles and fluids from patients to prevent the transmission of infections to health workers. To avoid further similar accidents, workers in this laboratory were instructed to manipulate samples in the test tube rack instead of holding the tubes in their hands.

The HIV epidemics and resurgence of TB with resistant strains outbreaks poses new challenges to healthcare workers, since less effective treatment available can result in increased morbidity and mortality. Insufficient retrospective surveys are conducted to estimate occupational hazards incidence,¹ while active surveillance programmes and mandatory reporting would probably provide more accurate assessment of this problem. This report reinforces the importance of regular information and training in compliance with protective measures as well as the need for more careful and thorough investigation of laboratory incidents.

Learning points

- ▶ Primary inoculation skin TB has a low incidence in developed countries, but healthcare personnel have an increased risk of infection.
- ▶ Erythema nodosum can occur in primary forms of TB.
- ▶ The resurgence of TB with HIV related and drug-resistant forms of the disease poses added risks to healthcare workers.
- ▶ This case emphasises the importance of protective measures to prevent occupational hazards, including regular information, training and supervision.

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Competing interests None.

Patient consent Obtained.

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