Introduction

Postprimary pulmonary tuberculosis (TB) is generally considered to be a disease of adults, occasionally occurring in adolescents [1, 2, 3]. The radiographic appearance of postprimary pulmonary TB in adults has been reviewed in the literature [2, 3, 4, 5], as has the appearance of primary pulmonary TB in children [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11]. The objective of this paper is to review the radiographic appearance of pediatric postprimary pulmonary TB.

Materials and methods

Cases were located from the teaching files of a pediatric radiologist, a search of the Central TB Registry for the years 1989–1999, and a search of medical record discharge diagnoses from 1980 to 1999. Cases were only included where both charts and radiographs were available. The medical records were reviewed for age at presentation, gender, sputum smear positivity for acid-fast bacilli (AFB), confirmation of diagnosis of TB, presence of extrapulmonary sites of infection, and presence of underlying medical conditions.

Both authors reviewed the chest radiographs. All radiographs were assessed for lobar distribution of parenchymal opacities and cavities, as well as for lymphadenopathy, pleural effusions or thickening, and evidence of prior pulmonary TB (calcified parenchymal foci, calcified mediastinal and hilar lymph nodes, scarring, volume loss).

Results

There were six pediatric patients from our institution with postprimary pulmonary TB (Table 1). Primary postprimary TB typically does not affect young children, five of the children in this series were less than ten years of age at the time of presentation.

Conclusion: The possibility of postprimary TB should be considered in pediatric patients at risk for this disease who present with upper-lobe pulmonary consolidation and cavitation. These patients are highly infectious and early recognition and treatment can limit transmission of TB.
disease was documented in the chart at least 14 months
erlier (range 14 months to 4 years) in five patients. In one
other patient the diagnosis of primary TB was inferred
from radiographic findings of prior disease (calcified
primary focus and calcified mediastinal lymph node).

Treatment of primary disease was well documented in
two patients. Patient 1 received 9 months of isoniazid
and three months of aminosalicylic acid. Patient 3 re-
ceived 9 months of both isoniazid and rifampin. Patients
4 and 5 were asymptomatic at the time of their primary
tuberculous infection and did not receive treatment.
Both were contacts of known TB cases and had positive
Mantoux tests and normal chest radiographs. No doc-
umentation of treatment of primary TB was available
for the two remaining patients. No patients presented
for interval medical attention between primary and
postprimary disease.

Chest radiographs or reports were available from the
episode of primary disease in five patients. Two patients
had normal chest radiographs. The other three patients
had right upper-lobe consolidation and right-sided hilar
and/or paratracheal lymphadenopathy. One of these
patients also had a right-sided pleural effusion, and one
had accompanying right upper-lobe atelectasis. No chest
radiographs demonstrated calcifications or cavitation.

At the time of presentation with postprimary disease
the patients ranged in age from 5 to 14 years. TB was
diagnosed by sputum culture in four cases, cerebral
abscess culture in one case, and the presence of AFB in
urine and a positive Mantoux test in one case. Three
patients were sputum smear positive for AFB.

Chest radiographs at the time of postprimary TB
demonstrated parenchymal opacities in all six patients
(Table 1 and Figs. 1, 2). Three had multifocal ill-defined
airspace opacities, suggesting endobronchial spread of
infection (Fig. 2). Five patients demonstrated pulmo-
nary cavities (Fig. 2). Two patients had apical pleural
thickening associated with upper lobe disease (Fig. 2a).
No patients had radiographic evidence of lymphaden-
opathy or pleural effusions.

Evidence of previous primary pulmonary TB was
seen on the radiographs of five patients. Two patients

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age (years)</th>
<th>Sex</th>
<th>Sputum smear for AFB</th>
<th>Consolidation</th>
<th>Cavitation</th>
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<td>RUL</td>
<td>RUL</td>
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<td>RUL, LUL</td>
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<td>8</td>
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<td>LUL</td>
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<tr>
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<td>9</td>
<td>F</td>
<td>Positive</td>
<td>RUL, LUL</td>
<td>RUL, LUL</td>
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<tr>
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<td>F</td>
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<td>RUL, LUL, LLL</td>
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<td>14</td>
<td>M</td>
<td>Positive</td>
<td>LUL</td>
<td>LUL</td>
</tr>
</tbody>
</table>

Table 1. Clinical and radiographic features of children with post-
primary pulmonary tuberculosis (AFB acid-fast bacilli, RUL right
upper lobe, LUL left upper lobe, LLL left lower lobe)

Fig. 1a–c. Patient 2. A 6-year-old female with confirmed postpri-
mary tuberculosis. a PA and b lateral radiographs of the chest show
right upper lobe opacity with right hilar and paratracheal
adenopathy. Primary tuberculosis. c PA chest radiograph 3 years
after a and b shows left upper-lobe opacity with cavitation and a
calcified azygous lymph node (arrow)