

## An interesting case of Ascaris in pleural effusion

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### Abstract

In developing countries like India, parasitic infections continue to be an important medical problem. The pulmonary involvement by *Ascaris* in the form of hypersensitivity reaction in the lungs has been well documented in the literature. However, the involvement of the pleural space is very rarely seen. Herein, we describe a case of a 32-year-old male patient who was found to have involvement of the pleural space by *Ascaris* and showed excellent response to anti-helminthic treatment. The report highlights the importance of considering *Ascaris* infection of the pleural space in those with lymphocytic predominant exudative pleural effusion. In tuberculosis-endemic countries, such cases are usually misdiagnosed and mistreated before the correct diagnosis is made. Thus, every effort should be made to make a final diagnosis before initiating treatment.

**Key words:** pleural effusion, *Ascaris*, VATS.

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### Case Report

A 34-year-old male patient presented with a history of low-grade fever, right-sided chest pain, dry cough for 6 months, and mild breathlessness on exertion for 4 months. He had a history of 10 kg weight loss in the last 6 months. He denied any history of wheezing, sputum, hemoptysis, skin rash, or joint pains. Six months before presentation to us, the patient had a history of right lower abdominal pain, vomiting, and fever for 15 days, for which he was diagnosed to have cecal perforation with a burst appendix, and laparotomy was done with the repair of perforation, appendectomy, and diversion ileostomy. He had sought medical care before presentation to our department and was on antitubercular therapy for 2 ½ months based on lymphocytic predominant exudative pleural effusion.

### Physical examination findings

The patient's vital signs included normal body temperature, blood pressure of 110/78 mm of Hg, respiratory rate of 26 breaths/min, heart rate of 110 beats/min, and oxygen saturation of 90% on room air. On respiratory system examination, breathing was labored, and chest wall movements were decreased on the right side in infra-axillary and infra-scapular areas with a dull note on percussion. Auscultation revealed absent air entry in corresponding areas and no added sounds.

### Diagnostic studies

A chest radiograph was obtained and compared with the film 2 ½ months before presentation (Figure 1A, B). The routine blood investigations, including total and differential leucocyte count, and liver and renal functions, were within normal limits. Computed tomography of the chest (Figure 1C, D) was done which revealed bilateral encysted pleural effusion (right > left). Ultrasound of right chest showed multiseptated effusion. Pleural fluid showed lymphocytic predominance with adenosine deaminase levels of 10.60 U/L and no atypical cells.

The patient underwent a diagnostic Video-Assisted Thoracic Surgery (VATS) and open decortication in view of undiagnosed and multi-septate effusion. The diagnosis of ascariasis as a cause of pleural effusion was made after observing the parasite on the pleural surface (Figure 2A, B) along with the confirmatory microscopic findings (Figure 2C, D). In the post-operative course, he had a prolonged air leak requiring negative suction for 10 days.

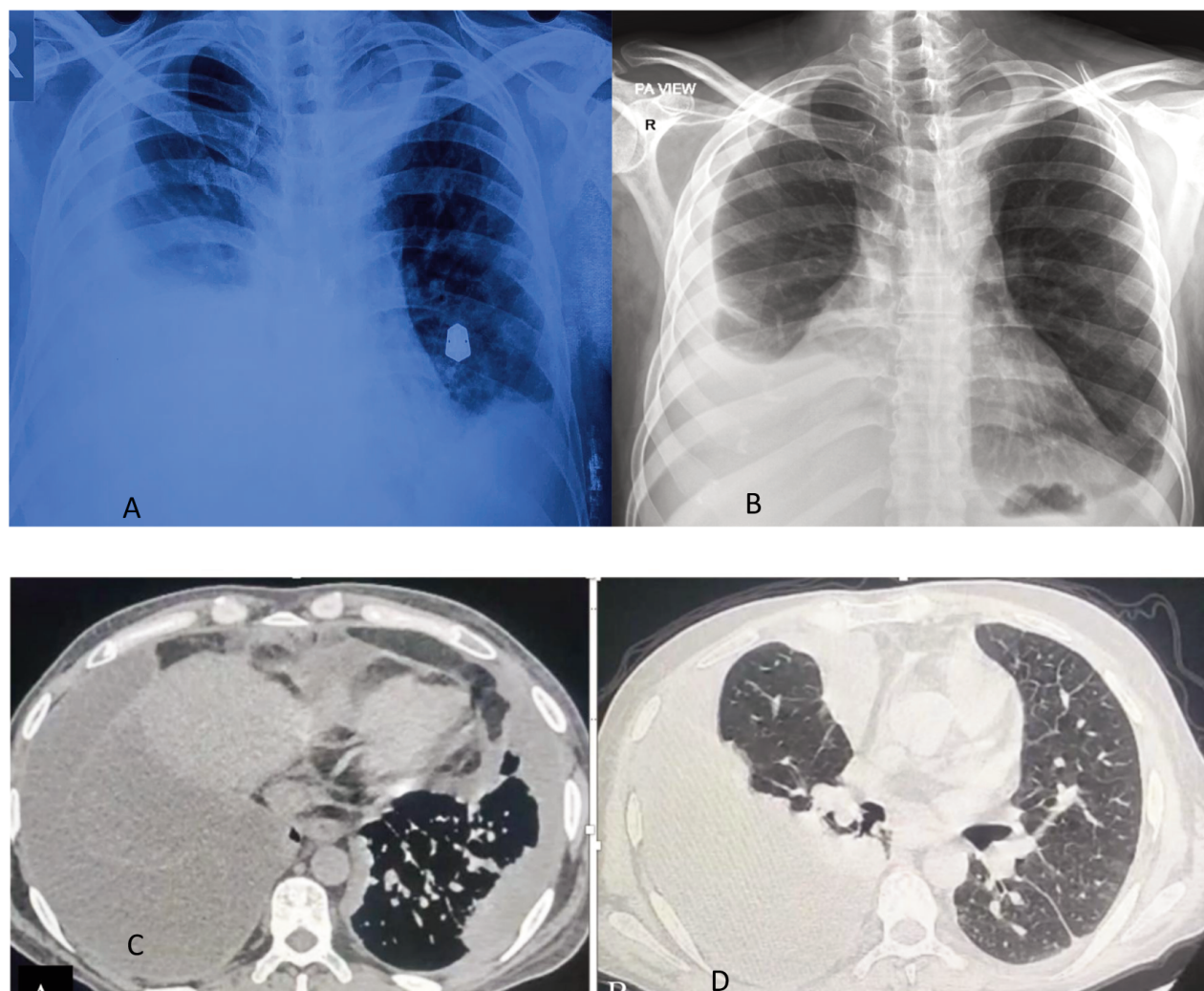
The patient was started on the antihelminthic drug albendazole 400 mg twice daily for 6 weeks. The patient improved clinically and radiologically and was asymptomatic at the last follow-up. A follow-up chest X-ray (Figure 3) showed complete resolution of pleural effusion and fully expanded bilateral lung zones.

## Discussion

Ascariasis is an important medical problem in many developing countries where public health and personal hygiene are at the lowest level.<sup>1</sup> *Ascaris lumbricoides*, the causative agent of ascariasis, is the most common parasitic worm infesting humans. Transmission of ascariasis to humans is by ingestion of eggs of the parasite in contaminated food. The eggshell, after getting digested by gastric juice, releases the larvae into the small bowel (first stage). The larvae then molt into second-stage larvae in the lumen of the small bowel. The second-stage larvae penetrate the wall of the intestine and migrate via lymphatics to the hepatic circulation and then to the right side of the heart and finally reach the lungs via systemic circulation. The larvae mature further in the alveoli to produce third- and fourth-stage larvae. The fourth-stage larvae make their way to the trachea and then get swallowed to reach back to the small bowel, where they develop into adult worms.<sup>2</sup> The migrating larvae can induce tissue and lung-granuloma formation causing hypersensitivity in the lungs and result in bronchospasm and transient infiltrates.<sup>3</sup>

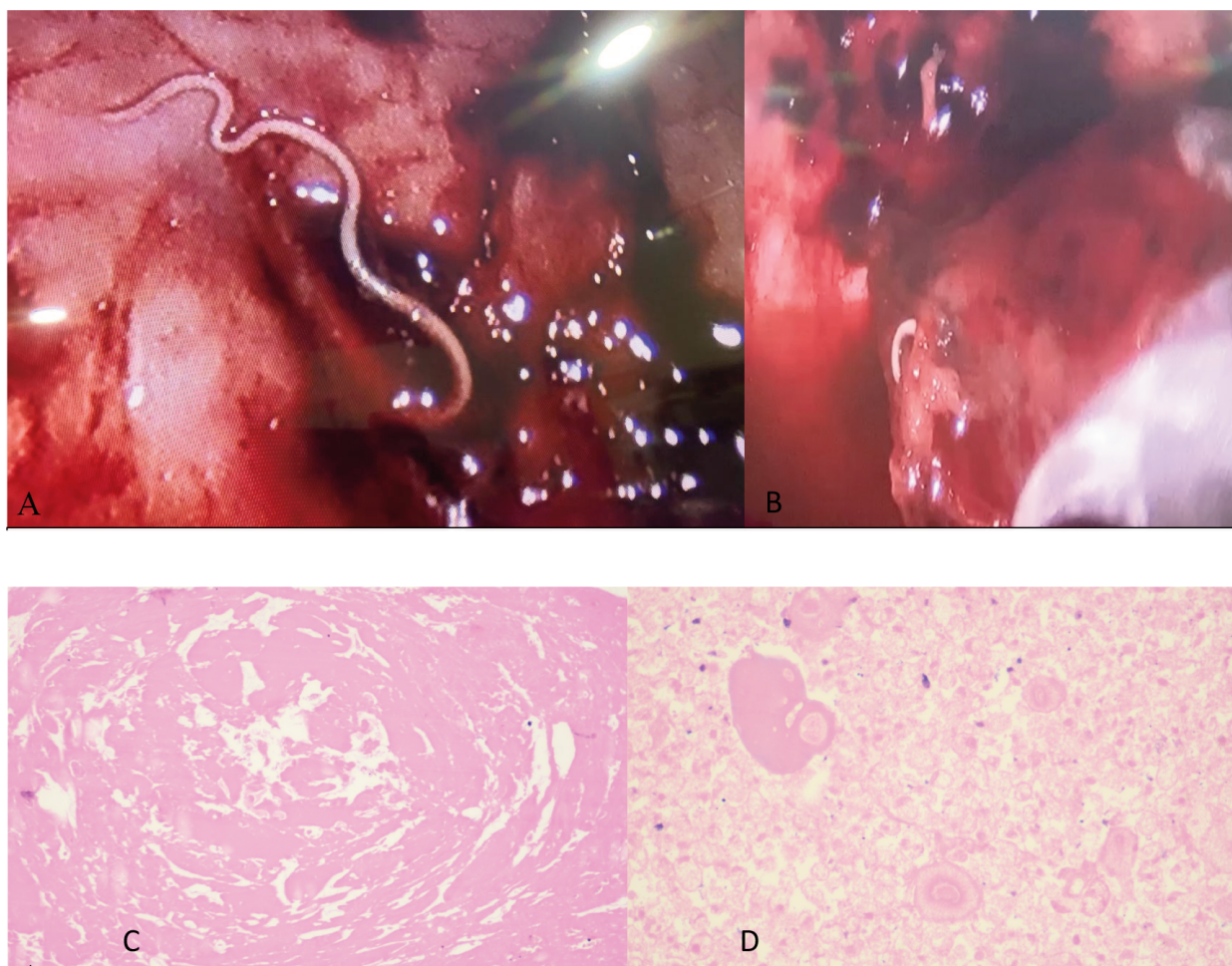
In most affected individuals, the adult worm resides in the gas-

trointestinal tract without causing any significant symptoms, but 8-15% of those infected may present with varied gastrointestinal, pulmonary, and neurological symptoms.<sup>4</sup> When the environment in the gastrointestinal tract becomes unfavorable, such as with inflammation and obstruction, *Ascaris* will migrate to other less hostile parts, which can lead to serious complications such as biliary obstruction,<sup>5</sup> liver abscess,<sup>6</sup> acute appendicitis,<sup>7</sup> intestinal obstruction<sup>8</sup> which may lead to significant morbidity and mortality. Pulmonary involvement is usually seen in the second stage of larvae maturation, when the migrating larvae can induce tissue and lung granuloma formation.<sup>2</sup> This may produce hypersensitivity in the lungs, resulting in peribronchial inflammation, increased bronchial mucus production, and bronchospasm.<sup>2</sup> However, the involvement of the pleural space is very rarely seen. Sen *et al.* reported a case of tuberculous pyo-pneumothorax with bronchopleural fistula in whom a mature *Ascaris* worm migrated from the intestines to lodge in the pleural cavity.<sup>9</sup> Lone RA *et al.* described the case of a 5-year-old boy in which a worm was seen emerging through a chest tube on the 5<sup>th</sup> day of its insertion.<sup>10</sup> Our case report documents intrapleural ascariasis as a rare cause of lymphocytic pleural effusion and stresses the importance of its awareness. In retrospect, the intestinal perforation and



**Figure 1. A, B)** CXR 2 ½ months prior and on presentation showed a mild decrease in pleural effusion. **C, D)** Computed Tomography (CT) showing bilateral right more than left encysted pleural effusion with normal lung parenchyma.





**Figure 2.** **A)** Video-Assisted Thoracic Surgery (VATS) view showed a worm on the parietal pleural surface. **B)** Another worm was seen penetrating through the visceral pleura, was pulled with forceps, and was broken. **C)** Ascaris cross section showing necrotic wall. **D)** Pleural surface showing egg of Ascaris.



**Figure 3.** Follow-up Chest X-Ray (CXR) showing resolution of pleural effusion.

subsequent repair done 6 months prior might have been due to ascariasis only, and its early recognition at that time might have prevented pleural complications.

## Conclusions

In developing countries like India, where tuberculosis is still not under control, every effort should be made to rule out all the differentials of lymphocytic exudative pleural effusion before treatment is initiated. In the long run, improved sanitation measures, especially proper excreta disposal, early diagnosis, and prompt treatment, can go a long way in reducing the prevalence of Ascaris infection in the community.

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