Fusobacterium nucleatum-Induced Empyema Masquerading as Lung Cancer
A case report

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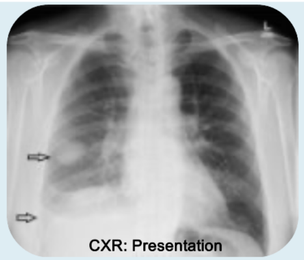
Introduction

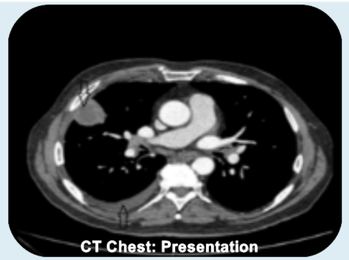
Fusobacterium nucleatum, a gram-negative anaerobe linked to periodontal disease, can cause severe infections such as empyema. These oral-type pleural infections often mimic malignancy on imaging, complicating diagnosis. Risk factors include age, comorbidities, trauma, and poor oral health. Prompt microbiological identification and tailored management are essential, especially in frail patients..

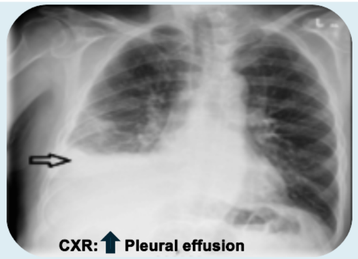
Case presentation

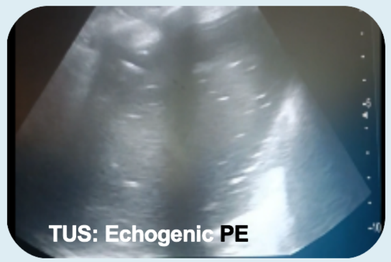
A 73-year-old man with hypertension, asbestos exposure, smoking history, and severe periodontal disease presented with progressive shortness of breath, weight loss, anorexia, and fatigue. Initial chest X-ray showed a 34 mm right lung lesion with a small pleural effusion. CT revealed a pleural-based low-density mass measuring 38 × 36 mm with a small pleural effusion too limited for aspiration, raising suspicion for malignancy or infection. The patient was discharged on oral antibiotics. He later underwent PET scan, which demonstrated right lung collapse with pleural uptake concerning for empyema. Thoracic ultrasound revealed echogenic effusion with air loculi and rising infection markers. Aspiration drained purulent fluid, and cultures confirmed ***Fusobacterium nucleatum*** and ***Leptotrichia***.

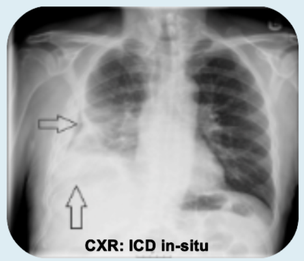
Investigations

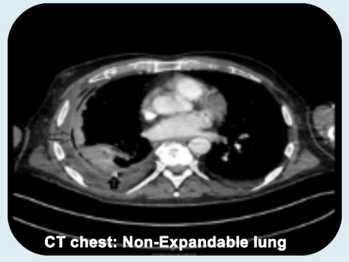

CXR: Presentation

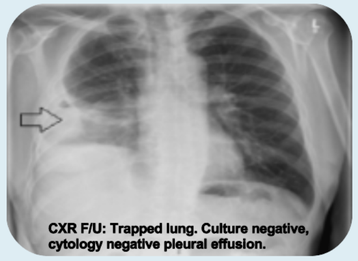

CT Chest: Presentation

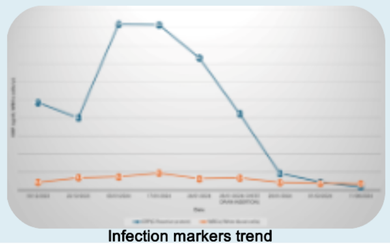

CXR: ⬆ Pleural effusion


TUS: Echogenic PE

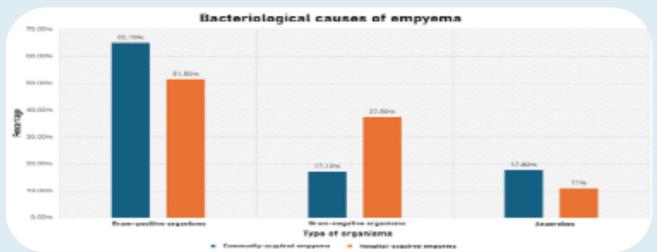

CXR: ICD in-situ

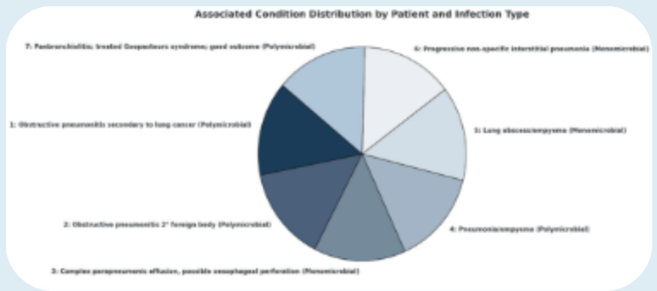

CT chest: Non-Expandable lung

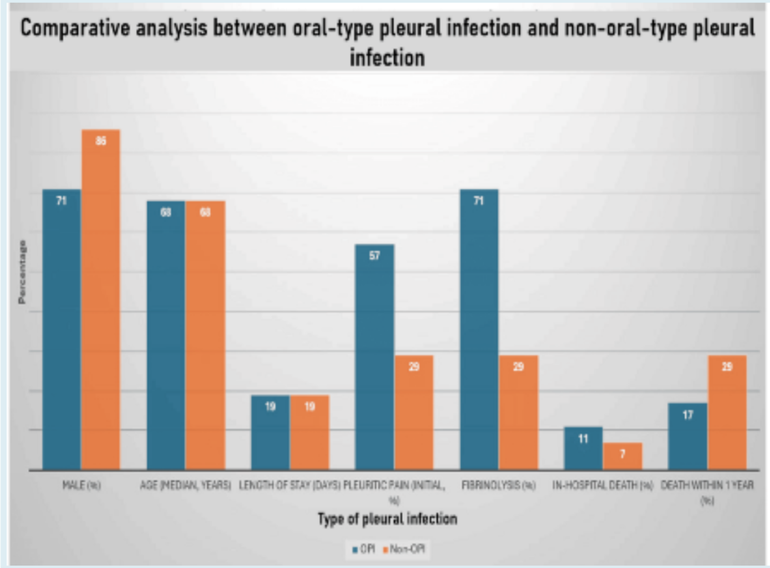

CXR F/U: Trapped lung. Culture negative, cytology negative pleural effusion.


Infection markers trend

Literature review







Outcome

The patient responded well to chest drainage and broad-spectrum antibiotics, achieving marked clinical improvement with normalization of inflammatory markers. Surgical intervention was not pursued, as he was unsuitable due to advanced age and comorbidities. Conservative management was therefore adopted, focusing on close monitoring, supportive care, and regular follow-up. Imaging demonstrated a trapped lung, likely caused by a thick visceral pleural rind. Despite these persistent radiological changes, the patient remained clinically stable and asymptomatic under conservative treatment.

Conclusion

Oral-type pleural infection, a subtype of pleural infection sometimes termed primary pleural infection, is associated with oral organisms including the ***Streptococcus anginosus*** group and ***Fusobacterium nucleatum***. Management requires early microbiological diagnosis, targeted antibiotic therapy, and drainage, while conservative strategies may be appropriate for frail patients not suitable for surgical intervention.

References

•Dalen CT, Mekhail AM: Lemierre syndrome: early recognition and management. CMAJ. 2015, 187:1229-31. 10.1503/cmaj.150476

•Dyrhovden R, Eagan TM, Fløtten Ø, et al.: Pleural empyema caused by Streptococcus intermedius and Fusobacterium nucleatum: a distinct entity of pleural infections. Clin Infect Dis. 2023, 77:1361-71. 10.1093/cid/ciad378