Disseminated Actinomycosis Mimicking Metastatic Ovarian Cancer

Dr Jonathan Carless, Dr Suzannah Hazeldine, Dr Oliver Lloyd

Royal Cornwall Hospitals NHS Trust

International Pathology Day 2024 #IPD2024

The Royal College of Pathologists
Pathology: the science behind the cure

Introduction

Actinomycosis is a rare disease resulting from chronic infection with Actinomyces bacteria. Typical presentations include cervicofacial, pelvic or pulmonary actinomycosis, however, it is crucial to note that actinomycosis may also present as a mimic of malignancy. Here we report a rare case of disseminated actinomycosis mimicking a metastatic ovarian neoplasm.

Case Presentation

A 37-year-old female with no previous history of malignancy was referred to microbiology following initial admission to A&E with fever and night sweats alongside increasing right pleuritic chest pain and RUQ pain for the past week.

Prior to referral, the patient received a CT chest, abdomen, pelvis and liver which was highly suspicious for a mediastinal mass as well as demonstrating multiple liver lesions of malignant appearance and bilateral adnexal masses suggestive of possible ovarian neoplasms. Blood tests revealed an iron deficiency anaemia. Initial differentials considered included primary ovarian malignancy or Krukenberg tumours and hepatic lymphoma. However, following MDT actinomycosis was suggested given the patient's IUCD and compatible appearance radiologically.

US guided liver biopsy was performed producing a pale needle core with multiple small fragments. On microscopy this revealed a sample comprising predominantly of neutrophils and debris, suggestive of an abscess, with several large colonies of filamentous bacterial organisms morphologically consistent with actinomyces organisms. There was no evidence of malignancy.

Following microbiology input, the patient began treatment with IV co-amoxiclav for disseminated actinomycosis with hepatic abscess, mediastinal inflammatory change and adnexal masses. Following 13 months of beta-lactam therapy, the patient made a significant recovery, with considerable improvement on CT.

Histology

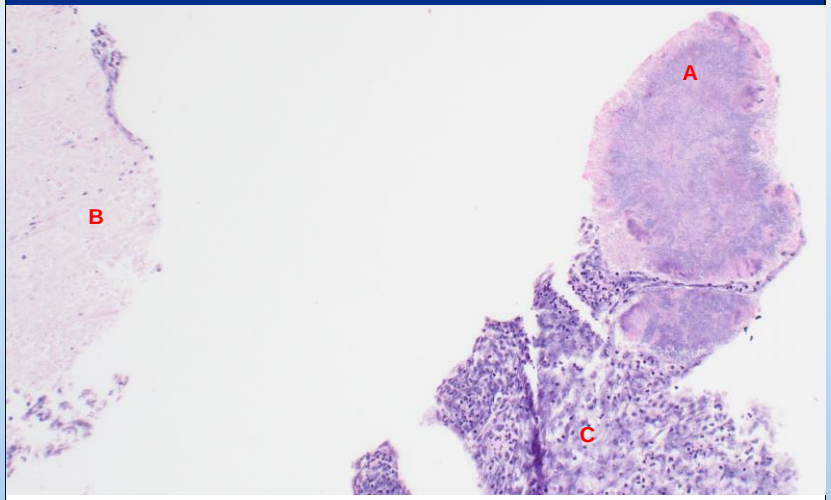

Figure 1. H&E stained section demonstrating an Actinomyces 'sulphur granule' (A), adjacent necrotic liver tissue (B) and inflammatory cells (C)

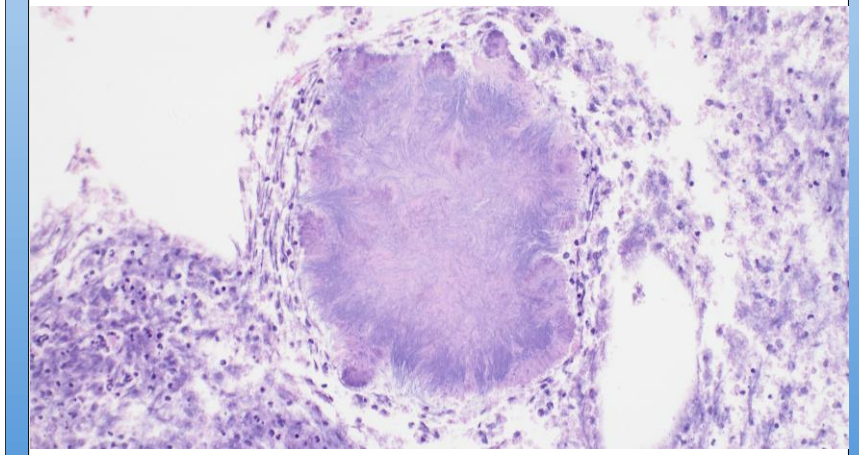

Figure 2. High power view of specimen demonstrating the characteristic Splendore-Hoeppli reaction surrounding an aggregate of filamentous Actinomyces bacteria on a background of necrotic debris and neutrophils

Discussion

Actinomycetes are commonly found in the normal microbiome of the oral cavity and less commonly in the gastrointestinal and female genital tract. Typically, their presence will not result in clinical disease unless the surrounding mucosa is significantly disrupted, providing a pathway for potential invasion.

In our case it was hypothesised that the bacteria initially entered the body from the vaginal tract due to the presence of an intrauterine contraceptive device (IUCD). Such devices are known to cause localised disruption to the endometrial mucosa including ulceration, haemorrhaging and atrophy. Consequently, long-term use has been linked to cases of pelvic actinomycosis. Following established infection, an intense inflammatory response typically follows with the potential for subsequent fibrosis to occur, as can be seen in our patient's liver biopsy. From there the infection typically spreads in a contiguous manner, which is what makes this case particularly interesting. Rarely actinomycosis can undergo haematogenous dissemination, as demonstrated by our patient's case where masses of the organism were present in both pelvic adnexa, the liver, and the mediastinum.

On review of the literature, to the best of our knowledge there have only been 10 published cases of disseminated actinomycosis linked to use of an IUCD. Infection is demonstrated as being more likely with longstanding IUCD placement with data demonstrating an average of 8 years in cases of pelvic actinomycosis.

Cases such as this highlight the significance of actinomycosis as an both a clinical and radiological mimic of malignancy that requires histological and microbiological input to diagnose and treat.

References

Valour F et al. Actinomycosis: etiology, clinical features, diagnosis, treatment, and management. Infect Drug Resist. 2014 Jul 5;7:183-97.

Okulicz J et al. Actinomycosis. Medscape, Nov 03, 2022. https://emedicine.medscape.com/article/211587.

Sheppard BL. Endometrial morphological changes in IUD users: a review. Contraception. 1987 Jul;36(1):1-10.