“A Rare Culprit with Devastating Sequelae: Serratia Marcescens Infective Endocarditis Leading to Multiorgan Failure”

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Clinical Scenario

We present a case of a 42-year-old male with a past medical history of diabetes and IV drug use treated for fever, chills and shortness of breath for one week initially found to be tachycardic and hypotensive with marked leukocytosis, thrombocytopenia, azotemia and an AKI. Blood cultures grew Serratia marcescens (SM).

Admission CT abdomen and pelvis showed linear/wedge-shaped hypodensities within the bilateral kidneys and the superior aspect of the spleen, likely representing multifocal embolic phenomenon, with septic emboli. (Figure 1). A CT brain showed no acute intracranial abnormality.

Echocardiogram showed a large echogenicity on the mitral valve leaflet prolapsing in the left atrium concerning vegetation. Perforation of the mitral valve leaflet with severe mitral regurgitation (Figure 2).

The patient was not a good surgical candidate. He was started on levofloxacin and cefepime. Cefepime was later changed to meropenem.

On day two, he became nonverbal, tachypneic, hypoxic and unarousable to noxious stimuli requiring intubation and admission to the Intensive Care Unit. Repeat brain CT showed multifocal subarachnoid hemorrhage within the bilateral frontal, left parietal and bilateral occipital lobes (Figure 3).

Transcranial Doppler ultrasound was negative for vasospasm. Diagnostic angiogram revealed no aneurysm, no AV malformations or fistula.

The patient continued to deteriorate despite aggressive medical therapy eventually expiring on day 10 of admission.

Literature Review

Infective endocarditis (IE) is an uncommon process; however, patients with certain heart conditions and risk factors are at a greater risk of developing it. In the last 25 years, its incidence has almost doubled.

Following the modified Duke criteria our patient met two of the major criteria and four of the minor criteria, making a definitive diagnosis of endocarditis.

A historically uncommon bacterium causing IE is Serratia Marcescens (SM), associated with 0.14 % of all cases.

Complications including systemic and metastatic phenomena are most seen with staphylococcus aureus infections.

IE due to non-HACEK gram-negative organisms tends to be associated with a higher mortality. Early surgical intervention is advised, though our patient’s condition had progressed too far to be considered.

In cases where surgery is not indicated, long-term therapy with targeted antibiotics is the standard of care.

Images

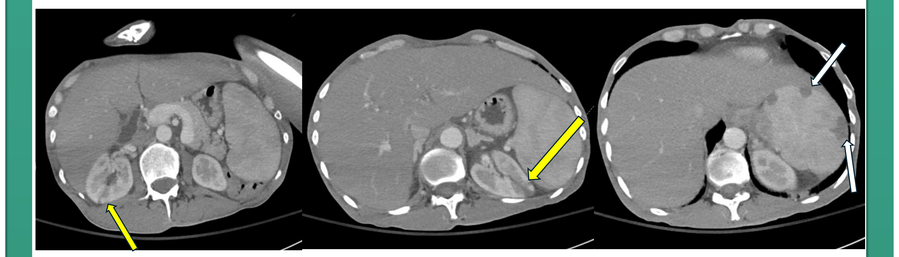

Figure 1: CT Abdomen and Pelvis showing linear/wedge-shaped hypodensities within the bilateral kidneys (yellow arrows) and the superior aspect of the spleen (white arrows)

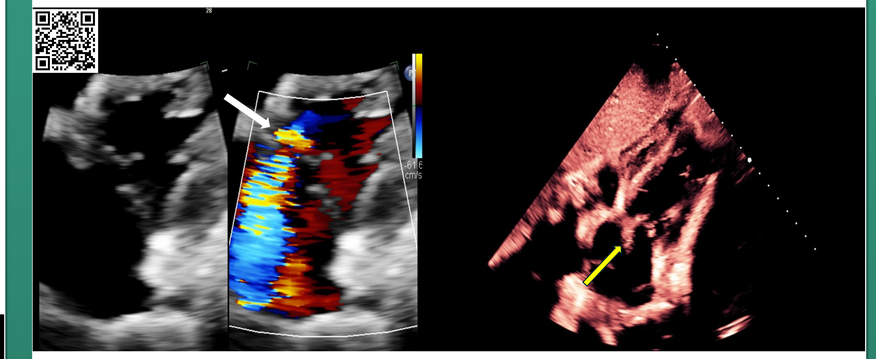

Figure 2: Echocardiogram showing echogenicity on the mitral valve leaflet prolapsing in the left atrium concerning vegetation (yellow arrow). Perforation of the mitral valve leaflet (white arrow) with severe mitral regurgitation.

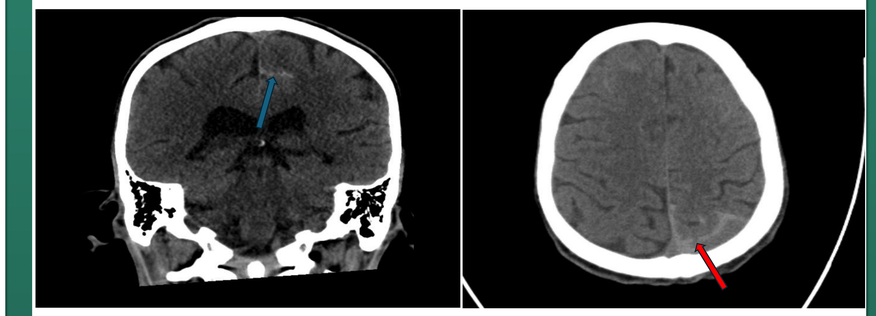

Figure 3: CT Brain showing multifocal subarachnoid hemorrhage within the left parietal (blue arrow) and left occipital (red arrow) lobes.

Unique Aspects

Unique findings described in this case include the rarity of SM endocarditis.

In general, non-HACEK gram-negative bacteria are not commonly found to be associated with IE.

Pathogens that are classically associated with IV drug use include Gram-positive bacteria and skin colonizers such as Staphylococcus aureus and Staphylococcus epidermitis.

It is also worth reporting the severe complications mentioned in this case, as our patient rapidly declined and expired just ten days after admission after experiencing multiorgan failure.

Multiple catastrophic complications occurred, including numerous septic embolisms, as well as a subarachnoid hemorrhage, which is only reported in 7% of IE cases.

Conclusion

With the rise in IV drug use, endocarditis caused by SM has become more common. Since treatment protocols for gram-negative IE are largely uniform regardless of the causative organism, greater attention should be directed toward prevention.

This is especially important given the association of SM with poorer outcomes such as increased rates of readmission and mortality.

Ultimately, because treatment is often limited by late presentation and severe complications, focusing on prevention, early detection, mitigation of risk factors, and close post-discharge follow-up is essential, as treatment alone may not significantly alter the poor prognosis.

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