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RESEARCH ARTICLE

INFECTIOUS ENDOCARDITIS ON MECHANICAL MITRAL PROSTHESIS, SEVERE PRESENTATION AND FAVOURABLE OUTCOME

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Abstract

Infective endocarditis (IE) is a serious and potentially fatal condition that affects the heart's inner lining, especially the heart valves. Despite advances in medical diagnosis and treatment, IE continues to pose significant challenges due to its severe complications, including embolic events, abscess formation, valve perforation, and spondylodiscitis. The left-sided heart valves (aortic and mitral) are most commonly affected by this infection. Identifying the portal of entry of the causative pathogen is crucial for effective management of the condition.This case report discusses a patient with Enterococcus faecalis infective endocarditis, who had mechanical aortic and mitral valve replacements. The infection's portal of entry was traced to a digestive adenocarcinoma, which is a rare but notable cause. The case is particularly significant due to the positive outcome achieved through a combination of medical and surgical interventions, highlighting the importance of a comprehensive approach to treatment.

Introduction:-

Infective endocarditis (IE) is an infection of one or more heart valves or the parietal endocardium, most often caused by bacteria, with Streptococcus or Staphylococcus responsible for 80% of cases [1]. Although IE is a rare complication of cardiac pacing or permanent valve surgery, it can be potentially fatal. The infection primarily occurs due to local contamination during the implantation procedure.

In recent years, the epidemiological profile of IE has changed significantly, partly due to the decline in rheumatic fever. There has also been a shift in the affected population, with an increasing number of elderly patients being diagnosed with IE, regardless of whether they have pre-existing valve disease (accounting for 50% of cases).

Case report

The patient was a 76-year-old woman with no modifiable cardiovascular risk factors. Her medical history included percutaneous mitral dilation in 2000, mitro-aortic valve replacement with mechanical valves (St. Jude No. 31 in the mitral position and No. 21 in the aortic position) in 2008, and dual-chamber pacemaker implantation in 2010. She was also under surveillance for permanent atrial fibrillation.

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She was admitted to our department with a fever that had persisted for a month, accompanied by a dry cough and sciatica. Upon examination, the patient was neurologically stable, with stable vital signs, and had a fever between 38.8 and 39.2°C. The physical examination also detected a murmur indicative of mitral insufficiency, crackles at the bases of both lungs, and erythematous papular lesions on the lower limbs (Figure 1).

Transthoracic echocardiography (TTE) followed by trans-esophageal echocardiography (TEE) were conducted, revealing a moderate mitral valve regurgitation with two mobile vegetations attached to the prosthetic valve and a trans-mitral gradient of 8 mmHg. The first vegetation measured 5.8 x 3.6 mm, while the second was 9.9 x 8.8 mm (Figure 2). There were no vegetations on the aortic prosthesis, although it did show moderate leakage. Both ventricles were functioning well, and the likelihood of pulmonary hypertension was considered intermediate.

The blood work-up revealed a C-reactive protein of 240 mg/l, white blood cells of 17,200 elements/µl and procalcitonin of 2.2. This infectious syndrome was confirmed by a cytobacteriological examination of the urine and blood cultures, all of which found Enterococcus faecalis sensitive to the following antibiotics: ampicillin, vancomycin, teicoplanin, linezolid and daptomycin.

Cerebral and thoraco-abdominal-pelvic CT scans were unremarkable. Lumbar magnetic resonance imaging showed acute L5-S1 spondylodiscitis (Figure 3). In view of the Enterococcus faecalis bacteremia, fibrocolonoscopy was performed, revealing a suspicious lesion at the esogastric junction classified as Siewart II and a suspicious lesion in the right colon 15 cm before the ileocaecal valve (Figure 4). Histopathological analysis of the biopsy revealed an ulcerated invasive adenocarcinoma of the esogastric junction and right colon.

The diagnosis of complicated infective endocarditis, on prosthetic material and with a digestive portal of entry was made (based on two major criteria and three minor criteria).

The initial treatment consisted of intravenous dual-antibiotic therapy with Cloxacillin and Gentamycin. This regimen was later adjusted based on antibiotic sensitivity results to Amoxicillin at a dose of 6g per 24 hours (adjusted for a GFR of 25 ml/min) and Ceftriaxone at 4g per 24 hours for a duration of 6 weeks. Blood cultures became negative by the sixth day of treatment. Anticoagulation with unfractionated heparin was continued. However, follow-up transoesophageal echocardiography (TEE) showed persistent vegetations with unchanged size and signs of mitral valve obstruction.

Following a multidisciplinary consultation, the endocarditis team opted for surgical intervention. The patient underwent a double mitro-aortic valve replacement with bio prostheses, along with the complete surgical removal of the pacemaker leads and box. This was followed by the implantation of epicardial electrodes in the ventricles and atria, and a new pacemaker was fitted (Figure 5). The patient was discharged after 1.5 months of treatment, having recovered from endocarditis.

Figure 1:- Embolic skin lesions (painless, erythematous papules) on the right lower leg.

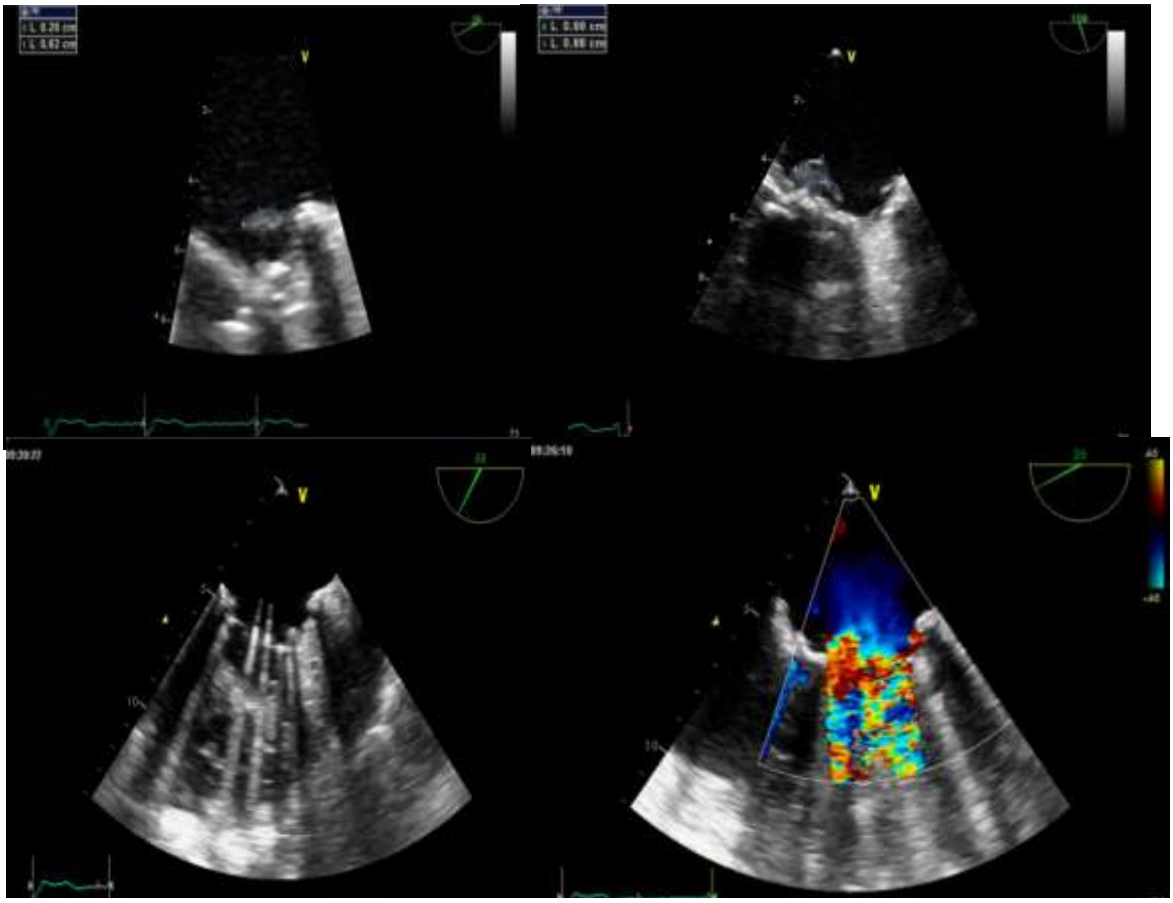

Figure 2:- TEE images of the mitral prosthesis: A: vegetation measuring 9.9 x 8.8 mm; B: other vegetation measuring 2.6 x 6.2 mm; D: moderate mitral insufficiency.

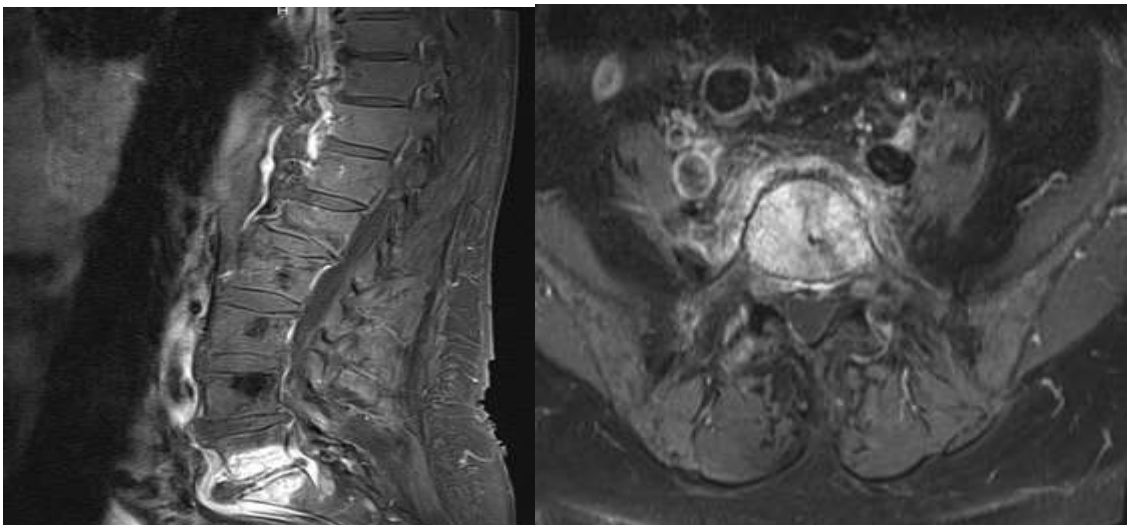

Figure 3:- Lumbar MRI showing an appearance compatible with acute L5-S1 spondylodiscitis in the early phase with infiltration of the soft tissues.

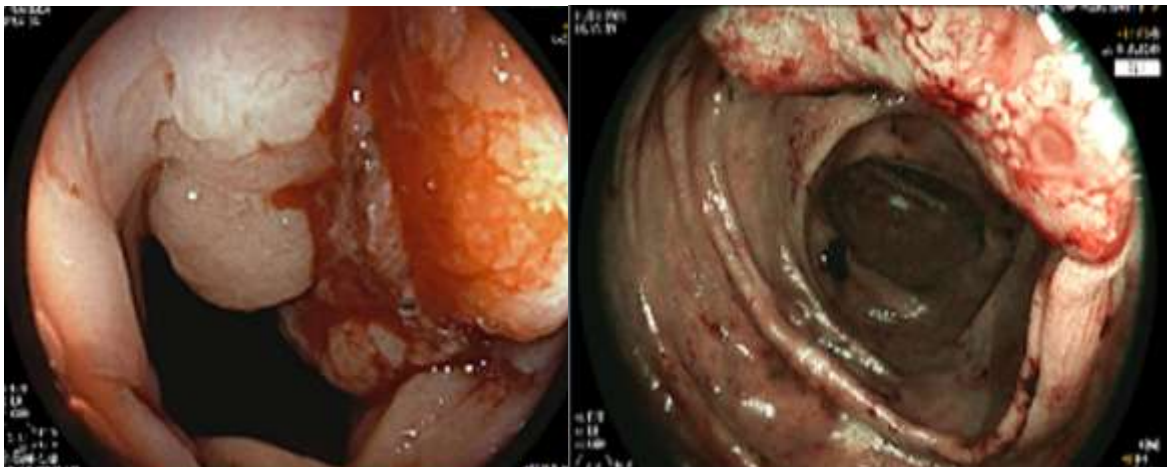

Figure 4:- Ulcerative lesions at the oesophageal-gastric junction (A) and in the right colon (B).

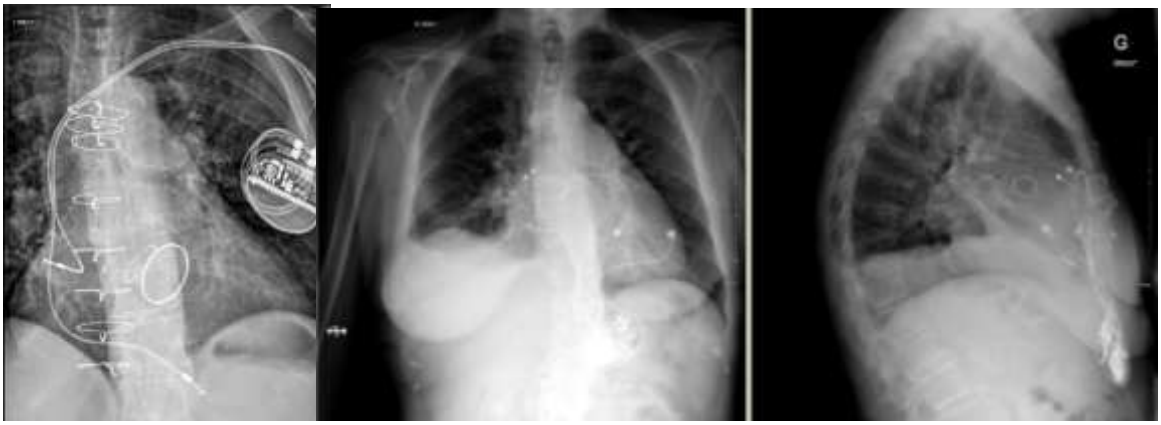

Figure 5:- 1st lung X-ray before surgery (left side); 2nd and 3rd after implantation of ventricular and atrial epicardial electrodes and fitting of a double-chamber pacemaker; images of the bioprosthetic in mitral and aortic position.

Discussion:-

Infective endocarditis (IE) is a severe condition associated with significant morbidity and mortality due to its complications [2]. Despite advances in the treatment of IE, the number of patients experiencing one or more complications that require surgical intervention has remained stable over the years [3]. Fecal enterococci, as found in our patient, is not the most common pathogen isolated in cases of both simple and complicated endocarditis; it is actually the third most common [2], [3].

In a retrospective study involving 363 cases of IE, spondylodiscitis (SD) was confirmed in 8% of the patients. The study also indicated that the presence of Enterococcus was independently associated with SD (odds ratio 4.42; 95% confidence interval (1.58-12.30)). SD was linked to a relapse of IE over a three-year period, while mortality rates were the same for IE patients with or without SD [4]. Furthermore, a six-week course of antibiotics was found to be no less effective than a twelve-week course for treating pyogenic spondylodiscitis over a year [5]. In our patient's case, SD could indicate one of two scenarios: either it resulted from IE or it is related to bone metastasis from digestive adenocarcinoma.

However, the resolution of the pain after the antibiotic treatment pointed towards a complication of the IE.

Identifying the source of infection is essential in the management of endocarditis. Unlike the well-established links between germs and their origins (e.g. oral streptococci, or digestive streptococci with Streptococcus bovis, etc.), the links between Enterococcus faecalis endocarditis and digestive cancer are still uncommon, as shown by clinical cases in the literature [6].

The episode of endocarditis led to the diagnosis of digestive cancer. Although colonoscopy is recommended for patients aged 65 and over, our patient's cardiac history may have forced systematic screening, and the weight loss syndrome may have been masked by congestion in heart failure.

The prevalence of endocarditis was 26% among E. faecalis bacteremia [6]. The ESC recommendations consider that Enterococcus spp infection is also typical of endocarditis, whatever the source of the infection, which reinforces the use of TTE in cases of Enterococcus faecalis bacteremia.

Antibiotic therapy was initiated with amoxicillin, cloxacillin, and gentamicin based on the initial identification of gram-positive cocci in the blood test on the first day of fever, which guided the choice of antibiotics. According to the European Society of Cardiology (ESC), the recommended antibiotic regimen for prosthetic valve IE occurring more than 12 months after surgery should include a combination of ampicillin, cloxacillin or ceftriaxone, and gentamicin to effectively cover Streptococcus species, Staphylococcus, and Enterococcus species [1]. After the antibiogram results, the treatment was adjusted to intravenous amoxicillin and ceftriaxone, with the amoxicillin dose modified according to the patient's renal function. Ampicillin was not used due to a regional shortage of the antibiotic.

In our case, surgery was indicated and performed 14 days after hospitalization, with extraction of the two mechanical valves, the two leads and the pacemaker battery, replaced with two bioprosthetic valves and an epicardial pacemaker respectively. In an observational study comparing the characteristics of endocarditis between patients with and without cancer, surgery was performed half as often in patients with cancer (24.2% versus 46.5%, $p = 0.01$) [7]. The decision to re-operate was supported by the patient's reassuring general condition.

Endocarditis with multiple complications continues to have a very poor prognosis, with fairly high mortality due to septic and hemodynamic repercussions. In addition to effective antibiotic therapy, surgery is usually required as soon as possible to rule out a life-threatening situation. Our patient is an example of a case that has progressed well despite several complications.

Conclusion:-

Infective endocarditis is an uncommon condition with a poor prognosis due to its complications, particularly septic embolic events and mycotic aneurysms. When located in the brain, mycotic aneurysms represent a rare diagnostic and therapeutic emergency with high morbidity and mortality rates. In practice, a CT angiography is used to diagnose these complications. The most common treatment for cerebral mycotic aneurysms is surgery, combined with a properly administered course of antibiotics.

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