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## PARAPROSTHETIC LEAKAGE AND INFECTION TWO YEARS AFTER THE KONNO PROCEDURE: A CASE REPORT

A middle-aged female presenting with progressive heart failure was admitted to the emergency department. She had a history of mitral and aortic valve replacement and a reoperation involving the Konno procedure. Echocardiography suggested a possible paraprosthetic leakage, which was confirmed during surgery. Additionally, severe infection, evidenced by an abscess near the great arteries, was discovered intraoperatively, despite the absence of fever or any prior signs of infection. This case underscores the importance of accurate diagnosis and thorough intraoperative exploration in identifying the underlying causes of the current condition and complications of previous cardiac surgeries. These are crucial for planning and performing a safe and effective reoperation.

**Ключевые слова** Konno procedure; paraprosthetic leakage; aortic valve replacement; infectious endocarditis

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### Introduction

Paraprosthetic leakage (PPL) is an uncommon yet significant complication that can occur after valve replacement. It is characterized by regurgitation around the prosthetic valve, often resulting from poor valve seating, tissue degeneration, or infection. If untreated, this regurgitation can eventually lead to heart failure. Paraprosthetic infection and/or endocarditis represents other serious postoperative complications.

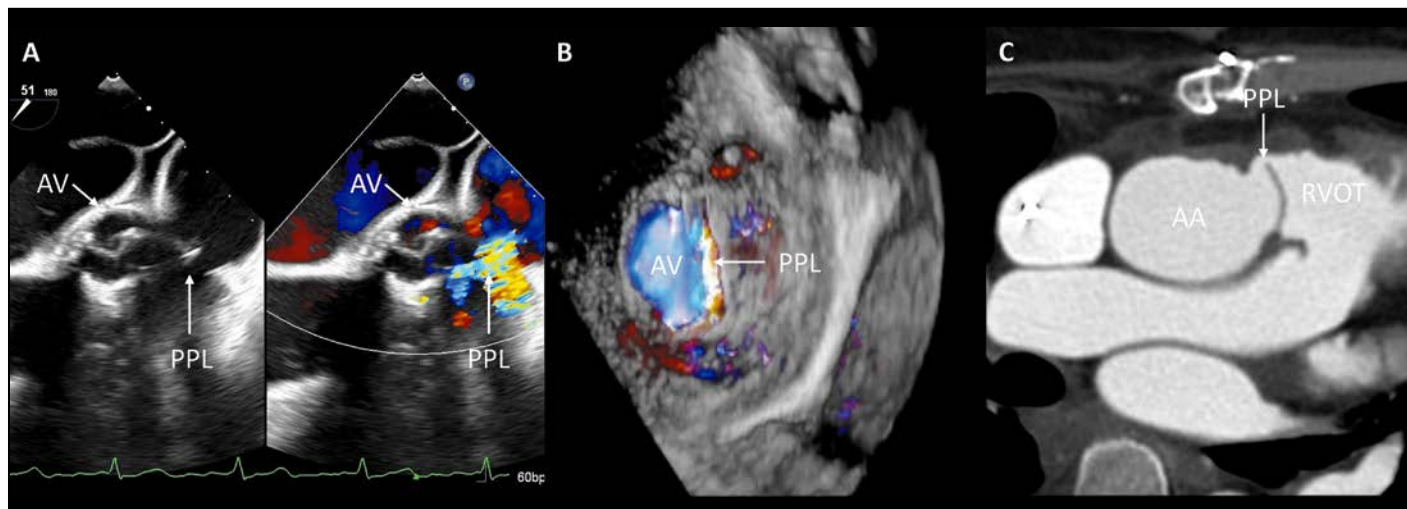
Although infrequent, PPL has been reported sporadically after procedures like the Konno operation, and often necessitating reoperation. This case report details a unique presentation of PPL with abscess formation, despite the absence of typical clinical symptoms, highlighting the critical

importance of early detection and thorough intraoperative assessment to prevent further deterioration and to optimize the surgical outcome.

### Case Report

A 48-year-old female presented with recurrent shortness of breath, chest tightness, and abdominal distention. She had previously undergone mitral and aortic valve replacement (AVR) with mechanical valves via median sternotomy nine years prior to the current admission. Due to valvular dysfunction, this was followed by a redo-AVR with a biological valve, along with a concomitant Konno procedure, two years prior. Both surgeries were performed in a local hospital, so detailed

**Рисунок 1.** Preoperative imaging showing the paraprosthetic regurgitation of the aortic valve and an abnormal connection between the ascending aorta and the right ventricle



A) Echocardiography; B) Three-dimensional echocardiography; C) Computed tomography.  
AV, aortic valve; PPL, paraprosthetic leakage; AA, ascending aorta; RVOT, right ventricle outflow tract.

information on the clinical treatment was not accessible. There was no history of immunosuppressive medication or glucocorticoid use, chronic illnesses, or other known conditions associated with immunodeficiency.

Echocardiography and computed tomography (CT) revealed pneumonia and significant paraprosthetic regurgitation of the aortic valve. An abnormal connection between the ascending aorta and the right ventricle was also detected (Figure 1). The initial diagnosis was PPL, along with lung infection. The leukocyte count was slightly elevated at  $11.89 \times 10^9/l$ ; neutrophils accounted for 63%. C-reactive protein concentration was 10.30 mg/l, procalcitonin was 0.539 ng/ml, and interleukin was 2050 pg/ml. Piperacillin-tazobactam was initially used as an empirical treatment. Given the patient's symptoms of worsening heart failure, emergency surgery was performed. Intraoperative findings confirmed PPL near the left coronary cusp. Also, a large abscess was present outside the reconstructed right ventricular outflow tract and adjacent to the previous pericardial patch from the Konno procedure (Figures 2A and 2B). Consequently, after removing the infected tissue, a redo-Konno procedure and AVR were performed (Figures 2C and 2D).

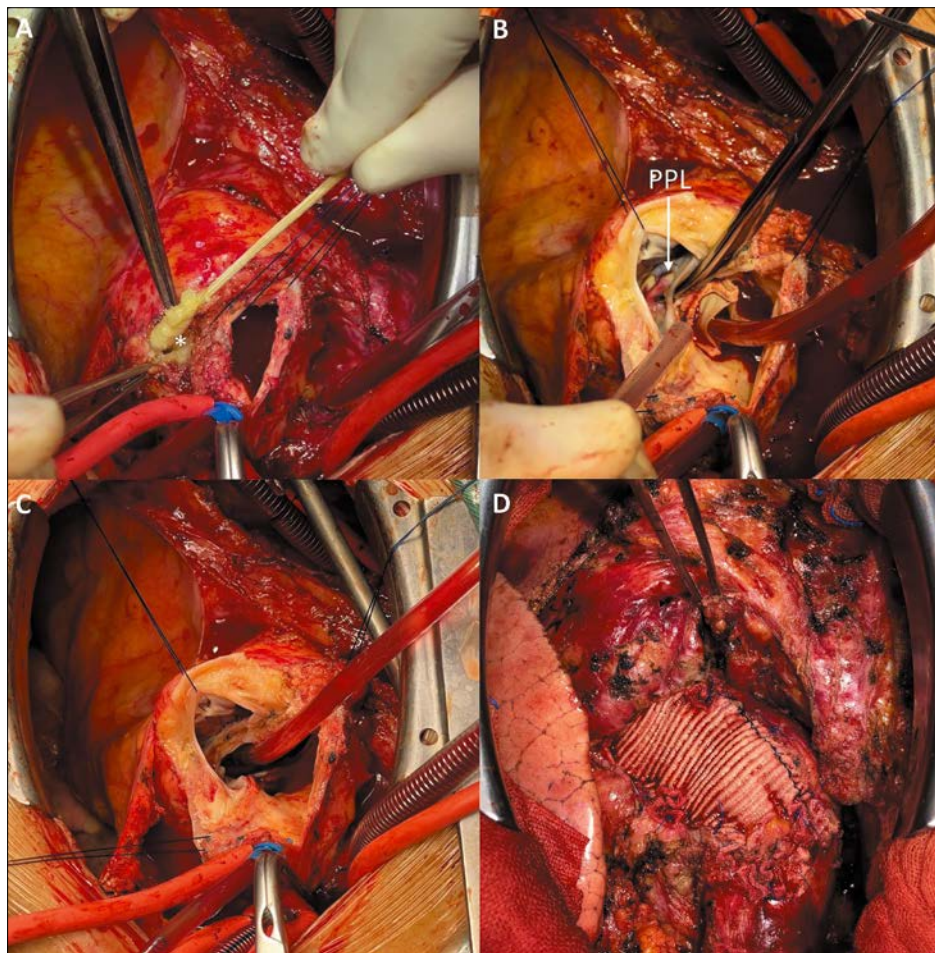
A microbiological study of the abscess and surrounding tissues was conducted, and blood cultures were performed. The results were all negative. We suspect that this was due to the chronic process.

The antibiotic treatment was upgraded postoperatively to vancomycin. The patient's recovery was uneventful. The follow-up echocardiography demonstrated satisfactory morphology of the prosthetic valves, and the reconstructed left and right ventricular outflow tracts. Two days before discharge, vancomycin was switched to ceftriaxone. This was done in consideration of the better safety and convenience of vancomycin without the need for repeated serum concentration monitoring. Ceftriaxone was continued for six weeks.

## Discussion

The Konno procedure, commonly performed concomitantly with AVR, is a specialized technique to enlarge the aor-

Рисунок 2. Intraoperative imaging showing the lesions and reconstruction



A) and B) Intraoperative pictures showing the abscess near the great arteries (\*) and the paraprosthetic leakage. C) and D) The Redo-Konno procedure was performed with the removal of lesions and incision of the septal. The outflow tracts of the left and right ventricles were reconstructed with an artificial graft. PPL, paraprosthetic leakage.

tic valve annulus and expand the left ventricular outflow tract. While the prognosis is generally favorable, complications such as anticoagulation-related issues, infection, and heart failure may arise. In a study by Sakamoto et al. [1], 63 patients were followed for an average of  $13.4 \pm 6.2$  yrs, during which two patients developed prosthesis-related endocarditis. In the current case, despite the absence of typical clinical signs of infection, such as fever, we noticed an abscess near the reconstructed right ventricular outflow tract during intraoperative exploration. This guided the decision to perform a redo-Konno procedure and to prescribe an eight-week course of postoperative antibiotics.

The atypical presentation of infection in this case suggests that such infections can remain localized, thus emphasizing the need for high clinical suspicion and meticulous intraoperative exploration. Extra attention is warranted when the medical history is complicated, especially when laboratory tests suggest a possible infection aside from pneumonia.

PPL is a relatively rare complication following valve replacement. Severe regurgitation can lead to heart failure

symptoms, and echocardiography is essential for timely diagnosis of PPL. A few cases of reoperations for PPL due to prosthesis outgrowth or dysfunction after the Konno procedure have been reported [2]. In such cases, patch replacement or additional septal incisions are typically performed to accommodate a larger prosthesis, and removal of lesions such as calcifications, thrombus, or abscesses may be necessary [2].

This case underscores the importance of accurate diagnostic imaging and thorough intraoperative exploration. While echocardiography provided critical initial insights, it was the intraoperative findings that confirmed the diagnosis. The decision to perform a redo-Konno procedure and AVR, despite the higher surgical risks, was crucial. In cases of sus-

pected PPL, early surgical intervention often plays a pivotal role in preventing further deterioration.

## Conclusion

Paraprosthetic leakage and infection are rare but serious complications of the Konno procedure. Their presentation can be insidious, and the associated surgical risks are significant. Therefore, careful differential diagnosis and meticulous surgical planning are crucial for optimizing the prognosis.

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