

POST-CARDIAC INJURY SYNDROME: DO WE OVERLOOK ITS PRESENCE? A CASE OF POST-PERICARDIOTOMY SYNDROME AND CURRENT UPDATE OF ITS MANAGEMENT STRATEGY.

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ABSTRA

Introduction: Postcardiac injury syndrome (PCIS) is the term that encompasses of postpericardiotomy syndrome, postmyocardial infarction syndrome, and post-traumatic pericarditis. The patient typically presents with fever, pericardial friction rub, and pericardial effusion with or without pleural effusion. The latency period between surgery and clinical manifestation greatly varied which not seldomly causing a delayed diagnosis of the disease.

Case Report: Herein we report a 30-year-old woman with 1-year history of constrictive pericarditis who was scheduled for a pericardiectomy. She had a history a liver tuberculosis of which she was treated with oral antituberculous drug for 18 months. Her physical examination showed an increased jugular venous pressure with a positive Kussmaul's Sign, cardiomegaly, and minimal bipedal pitting edema, with otherwise normal examination. Her transesophageal echocardiography (TEE) and MSCT cardiac were positive for constrictive pericarditis. The surgery was uneventful with 200 mL of serous pericardial fluid was removed. Ten days after the surgery, the patient complained fever with increased production of the drainage. She was then assessed as post pericardiotomy syndrome and was given high dose steroid. The drainage was gradually decreased and she was discharged after ten days with anti-inflammatory

Conclusion: While PCIS is not uncommon, physicians practicing in the field of pulmonary and critical care medicine, and cardiac surgery should be aware not only the presence of this disease, but also to master its prevention and treatment.

Keywords: Postpericardiotomy syndrome, postpericardiac injury syndrome, pleural effusion, cardiac surgery, prevention

ABSTRAK

Pendahuluan: Postcardiac injury syndrome merupakan istilah yang menggambarkan postpericardiotomy syndrome, postmyocardial infarction syndrome, and post-traumatic pericarditis. Pasien menunjukkan adanya demam, pericardial friction rub, dan efusi perikardial dengan atau tanpa efusi pleura. Periode laten antara operasi dan manifestasi klinis bervariasi yang tidak jarang menyebabkan keterlambatan diagnosis.

Laporan Kasus: Seorang perempuan berusia 30 tahun dengan riwayat perikarditis restriktif 1 tahun dijadwalkan menjalani perikardiektomi. Pasien memiliki riwayat tuberculosis hepar yang sudah ditangani obat antituberkulosis selama 18 bulan. Pemeriksaan

fisik menunjukkan adanya peningkatan tekanan vena jugular dengan tanda Kussmaul positif, kardiomegali, dan pitting edema bipedal minimal. Pemeriksaan transesophageal echocardiography

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(TEE) dan MSCT jantung menunjukkan adanya perikarditis restriktif. Dari operasi, didapatkan cairan perikardial sebanyak 200mL. Sepuluh hari setelah operasi, pasien mengeluhkan adanya demam dengan peningkatan disertai peningkatan drainase. Kemudian pasien didiagnosis sebagai post pericardiotomy syndrome dan pasien mendapatkan steroid dosis tinggi. Produksi drainase berkurang dan pasien dipulangkan setelah perawatan 10 hari dengan pemberian anti inflamasi.

Kesimpulan: Meskipun PCIS tidak jarang terjadi, tetapi klinisi yang bekerja di bidang paru dan penyakit kritis serta bedah jantung harus menyadari mengenai postcardiac injury syndrome serta menguasai pencegahan dan penatalaksanannya.

Kata kunci: Postpericardiotomy syndrome, postpericardiac injury syndrome, efusi pleura, operasi jantung, pencegahan

INTRODUCTION

Post-cardiac injury syndrome (PCIS) is the term that encompasses of post-pericardiotomy syndrome (PPS), post-myocardial infarction syndrome and post-traumatic pericarditis.^{1,2} The patient typically presents with specific clinical signs and symptoms after a recent cardiac injury, including fever, pericardial friction rub, and pericardial effusion with or without pleural effusion.^{1,3} In patients with PPS, the latency period between surgery and clinical manifestation greatly varied between 3–140 days which not seldomly causing a delayed diagnosis and underdiagnosis of the disease.^{4,5} While life-threatening condition is rare, the incidence of recurrences is high with previously reported between 30–39%.^{4,6} Moreover, this condition contributes to postoperative morbidity because it has been associated with cardiac tamponade, longer hospitalization, and more hospital readmissions.^{4,7} Therefore, the main aim of this account is to report a case report of PPS and to address the current management strategies of PPS in light of the new increasing evidences in reducing the burden of the disease.

CASE REPORT

A 30-year-old woman who was previously diagnosed with constrictive pericarditis was scheduled for an elective pericardiectomy. She had a one-year history of dyspnea on exertion (DOE), orthopnea, paroxysmal nocturnal dyspnea (PND), and bilateral ankle swelling. She had a past history of liver tuberculosis 8 years ago of which she was treated with oral antituberculous drug for 18 months. She routinely consumed furosemide 40 mg per day to control edema and to alleviate her symptoms. On admission, her physical examination showed that she was fully alert, hemodynamically stable, with normal vital signs. There was an increased jugular venous pressure with a positive Kussmaul's Sign, cardiomegaly, and minimal bipedal pitting edema, with otherwise remarkable examination. Transesophageal echocardiography (TEE) showed dilated RA, RV, D-shaped LV, pericardial thickening at anterior, anterolateral, apex RV, apex LV, with consolidation mass at pericardial sac RV. The MSCT Cardiac revealed right atrial dilatation, with minimal pericardial effusion and signs of constrictive pericarditis. Her angiography showed normal coronary vascularization. The baseline laboratory values were within normal limit, except for mild hypokalemia and hypocalcemia which was possibly caused by diuretics. Her ANA test was negative.

The surgery was uneventful with 200 mL of serous pericardial fluid and anterior segment of pericardium was removed. Substernal and intercostal drains were inserted. Pericardial fluid analysis was performed which showed exudative characteristics, with Adenosine Deaminase (ADA) test of 5 U/L, negative Acid Fast Bacilli (AFB) and GeneXpert test. Cytology of pericardial fluid showed chronic non-specific inflammation with no malignant cells. On post-operative day 5, the patient developed fever without any clinical signs and symptoms of focal infection. The Chest X-ray revealed no new pulmonary infiltrates (Figure 1), normal urinalysis but with increased blood WBC count (19.460/ μ L) and CRP of 7,01 mg/dL (normal values <0,3mg/dL). She was diagnosed with Central-Line associated Bloodstream Infection (CLABSI), and the removal of central venous catheter (CVC) and

appropriate culture was done. A Broad spectrum antibiotic was initiated, and the antibiotic later was changed for specific microorganism which turned out to be *Aeromonas hydrophila*. The fever resolved in 48 hours after the antibiotics was given, but spiked again in post-operative day 10 along with increased production of the drainage (Figure 2). She was then assessed as PPS and was given 60 mg intravenous dexamethasone. The drainage was gradually decreased and she was discharged after ten days with anti-inflammatory medication.

DISCUSSION

The patient presented in the case report was not uncommon, rather was a typical case of PPS yet frequently underrecognized.⁵ The diagnosis of PPS was established because she fulfilled the diagnosis criteria, which is a recent history of cardiac injury (typically ranging between 1 week to 3 months earlier) with minimum two of these five criteria: fever without an alternative explanation, pericardial or pleuritic chest pain,

pericardial or pleural rubs, pericardial effusion, and/or pleural effusion with elevated C-reactive protein (CRP).¹⁻³ Fever and increased of drainage production which designates effusion, along with increased of CRP, were found in this patient. Infection as the underlying cause of fever must firstly be excluded before it can be included in the clinical criteria.³ As in our case, the PPS could not be diagnosed unless the underlying infection was cleared. Furthermore, postoperative fever is not uncommon after cardiopulmonary bypass (CPB) and thus should be in differential diagnosis of patient presenting with fever after cardiac surgery.⁸ Common cardiac procedures in triggering PPS include Coronary Artery Bypass Graft (CABG), valvular surgery, aortic surgery, combination or other cardiac procedures involving manipulation of pericardium and pleura.^{9,10} One should consider that clinical presentation of PPS may highly vary, especially its latency time after the surgery and the presence of inflammatory marker.⁴ The incidence of these features in a cohort of 239

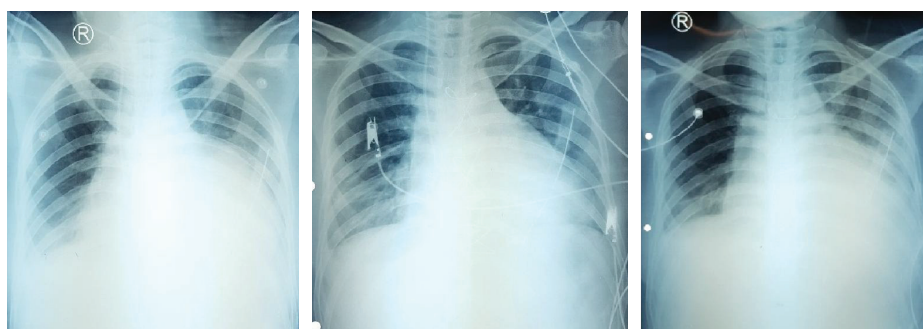


Figure 1. Chest Xray After Pericardiectomy (A), Post-operative Day 5 (B), and Post-operative Day 10 (C)

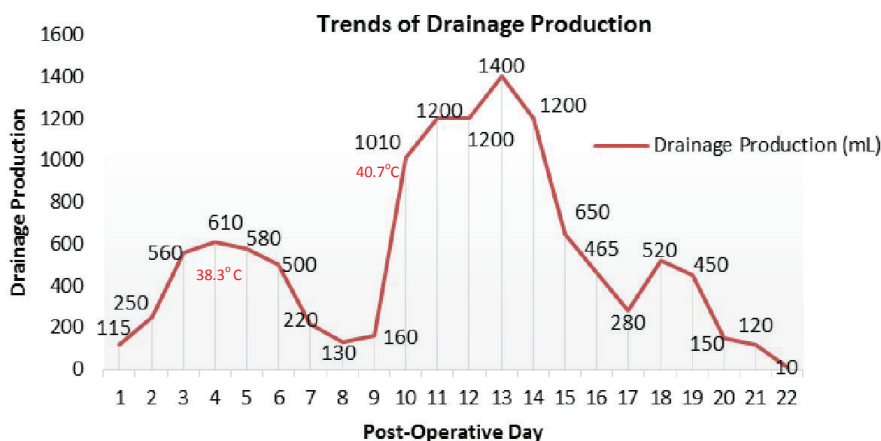


Figure 2. Trends of Drainage Production. (High dose dexamethasone was initiated on postoperative day 13)

patients with PPS following cardiac surgery were elevated C-reactive protein (100%), new or worsening pericardial effusion (88%), pleuritic chest pain (57%), fever (47%), pleural effusion (41%), and pericardial rub (21%).⁷

The treatments of choice of patients with PPS according to the current guideline are non-steroidal anti-inflammatory drugs (NSAIDs), colchicine, and corticosteroid,² although strictly speaking there are no randomized controlled trials addressing specific treatment approaches for PPS. The NSAIDs of choice are between aspirin 750-1000 every 8 hour for 1-2 weeks followed by gradual tapering by 250-500 mg every 1 week or Ibuprofen 600 mg every 8 hour for 1-2 weeks followed by gradual tapering by 200-400 mg every 1 week.² The former was preferred if the patient is already in antiplatelet treatment. Colchicine is added to NSAIDs or steroid as an adjunctive therapy to improve the response to medical therapy and prevent recurrences.¹¹⁻¹³ The adjunctive dose of colchicine are 0.5 mg once daily for patients <70 kg, and 0,5 mg twice daily for those ≥70 kg.^{12,13} Colchicine is not recommended for this condition if there is no signs of systemic inflammation.¹⁴ Furthermore, NSAIDs therapy is not indicated in asymptomatic patients.¹⁵ Corticosteroids should be considered as a second-line agent, especially in patients with failure or contraindications of NSAIDs.^{2,16} Low to moderate doses (prednisone 0,2–0,5 mg/kg/day or equivalent) should be used instead of high doses (prednisone 1,0 mg/kg/day or equivalent).^{6,16} The steroid should be maintained for several weeks with a slow tapering every 2-4 weeks after remission.¹⁶ In this patient, intravenous steroid was given with appropriate tapering, and the drainage was gradually resolved.

Due to the burden of the disease, strategies to prevent this immune mediated phenomenon have become the spotlight of the research nowadays. Prophylaxis strategies in reducing PPS have been extensively studied, including the type of medication and the timing of administration. Aspirin, diclofenac, metilprednisolone, dexamethasone, and colchicine were among the medications that have been studied for the primary prevention of PPS.^{15,17-21} Colchicine administration was

superior among other medications and has been shown significantly reduce the incidence of PPS.^{17,18,20} While corticosteroid usage as the primary prevention of PPS is still controversial, recent trials and accounts are seemingly disappointing.^{19,22,23} The recommended timing of colchicine administration is in 72 hours following cardiac surgery with 0,5–0,6 mg daily for patients <70 kg, and 0,5–0,6 mg twice daily for those 70 kg.²⁴ Due to the gastrointestinal side effects of colchicine, including abdominal pain nausea, vomiting, and diarrhea which frequently lead to discontinuation of the medication, administration of colchicine should be adjusted not only according to body weight, but also the creatinine clearance (CrCl) and age (>70 years reduce 50% dose and consider CrCl).^{2,24} The current guideline for colchicine dosing in patients with renal impairment are as follows: CrCl 35–49 mL/min 0,5–0,6 mg once daily, CrCl 10–34 mL/min 0,5–0,6 mg every 2–3 days, and with CrCl <10 mL/min avoid colchicine administration.² The regimen is suggested be continued for 30 days after initiation.^{17,18} While recommendations are clearly suggesting the use of colchicine in preventing PPS, it is not currently followed in our local hospital. As in our case, the patient was not given any medication for PPS prevention.

CONCLUSION

Post-pericardiotomy syndrome (PPS) as a subtype of PCIS is not a rare entity yet frequently underrecognized. While life-threatening condition is considered as infrequent, PPS is associated with longer hospitalization and more hospital readmissions. Colchicine administration following cardiac surgery should be recommended in our daily practice in preventing the occurrence of PPS. Physicians practicing in the field of pulmonary and critical care medicine, and cardiac surgery should be aware not only the presence of this disease, but also to master its prevention and treatment.

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