CASE REPORT

Pyopericardium progressing to tamponade in a patient with immune thrombocytopenia

Manoj Gopalakrishnan,¹ Robin George Manappallil,¹ Harilal Nambiar,² John Francis John³

¹Internal Medicine, Baby Memorial Hospital, Calicut, India

²Cardiothoracic and Vascular Surgery, Baby Memorial Hospital, Calicut, India

³Cardiology, Baby Memorial Hospital, Calicut, Kerala, India

Correspondence to

Dr Robin George Manappallil, drrobingeorgeml@gmail.com, gm.varghese@hotmail.com

Accepted 27 April 2018

SUMMARY

Pericardial effusion can develop during any stage of pericarditis, and small effusions that appear rapidly can cause cardiac tamponade. Pyopericardium is a rare aetiology for tamponade. This is a case of an elderly diabetic lady, on steroid therapy for immune thrombocytopenia, who presented with fever and acute dyspnoea. She developed cardiac tamponade due to pyopericardium with *Staphylococcus* as the causative organism. *Staphylococcus* pyopericardium, in the absence of a primary focus of infection, progressing to tamponade is an uncommon scenario.

BACKGROUND

Pyopericardium refers to accumulation of pus in the pericardial cavity following infection by pyogenic organisms like *Haemophilus influenzae*, *Staphylococcus aureus*, *Streptococcus*, *Pneumococcus*, *Meningococcus*, *Mycoplasma*, tularemia, *Listeria*, leptospirosis, *Mycobacterium tuberculosis*, Q-fever, *Salmonella* and so on.¹ These patients may be at risk of developing cardiac tamponade. In the present antibiotic era, the incidence of pyopericardium has become uncommon, accounting for less than 1% cases of acute pericarditis.² The mortality rate in treated and untreated patients are 40% and 100%, respectively.^{3–5} Immune thrombocytopenia is an autoimmune haematological disorder characterised by isolated thrombocytopenia without any clinically apparent cause. The patient being described is an elderly diabetic woman with immune thrombocytopenia (on steroids) who presented with fever and dyspnoea and was found to have pyopericardium progressing to tamponade. Though pericardial interventions are not necessary in haemodynamically stable patients, this case projects the importance of pericardial fluid analysis in the presence of fever and active intervention in order to prevent tamponade.

CASE PRESENTATION

A 67-year-old woman presented to the emergency department with history of fever since 4 days. She also complained of dyspnoea since morning (MRC grade 2). She is a known case of immune thrombocytopenia (on oral prednisolone 20 mg once daily) and diabetes mellitus (on insulin therapy). She did not have any other cardiac or systemic ailments, and did not undergo any surgical procedures in the recent past.

On examination, she was conscious, oriented and febrile (101°F). Her pulse rate was 100/min, blood pressure 120/90 mm Hg and respiratory rate 22/min with saturation 94% (room air). Systemic examinations were normal.

INVESTIGATIONS

Her complete blood count showed anaemia (10.3 g/dL), leucocytosis ($21.5 \times 10^9/L$ with neutrophils 85%, lymphocytes 11%, eosinophils 4%) and mild thrombocytopenia ($140 \times 10^9/L$). Her renal and liver functions, electrolytes, prothrombin time, activated partial thromboplastin time, TSH and urine microscopy were normal. Random blood glucose and HbA1c were 197 mg/dL and 7.5%, respectively. ESR was elevated (75 mm/h). Viral markers (HIV, HBsAg, anti-HCV), dengue and leptospirosis serology, Weil Felix, Mantoux test and malarial smear were negative. ANA profile, anticyclic citrullinated peptide and rheumatoid factor were also negative. Ultrasound of the abdomen and pelvis was normal. Chest X-ray showed cardiomegaly (figure 1). Electrocardiography had sinus tachycardia and right QRS axis deviation and echocardiography revealed mild to moderate pericardial effusion, which was also seen on computed tomography of thorax (figure 2).

TREATMENT

She was started on intravenous piperacillin/tazobactam (4.5 g every 6 hours) along with oral paracetamol. Blood glucose levels were controlled with insulin. Prednisolone was withheld. Since she was haemodynamically stable, pericardial intervention was not done. Her blood culture grew *S. aureus*. Intravenous vancomycin (15 mg/kg every 12 hours) was started as per antibiotic sensitivity report and piperacillin/tazobactam was continued as it showed intermediate sensitivity.

OUTCOME AND FOLLOW-UP

Following initiation of vancomycin, her fever spikes started decreasing. On day 5 of admission, she had hypotension. Her heart sounds were muffled. Jugular venous pressure was not elevated and pulsus paradoxus was absent. Repeat echocardiography revealed impending cardiac tamponade. An emergency pericardial window was performed and about 500 mL of pus was removed. The window was closed with drain in situ, which was removed after 7 days. Pericardial pus culture also grew *S. aureus* and AFB stain was negative. Piperacillin/

To cite: Gopalakrishnan M, Manappallil RG, Nambiar H, et al. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2018-225009

Figure 1 Chest X-ray showing cardiomegaly.

tazobactam and vancomycin were given for 10 and 20 days, respectively. Her echocardiography after 10 days did not reveal any effusion and repeat chest X-ray also showed improvement (figure 3). She was discharged on day 26 of admission on insulin alone. On follow-up after 1 week of discharge, she was asymptomatic. Her complete haemogram showed haemoglobin 11.4 g/dL, white blood cell count $9.8 \times 10^9/L$ and platelet count $110 \times 10^9/L$. Prednisolone was withheld and the patient was asked to check her haemogram regularly, especially on noticing any gum bleeding or petechial patches.

DISCUSSION

As mentioned earlier, pyopericardium is a rare and fatal condition. About 90% of acute pericarditis are either idiopathic or due to viral aetiology.⁶ Bacterial pericarditis is usually not a primary infection, but occurs as a complication of an underlying infection. Immunosuppression, chest injuries and chronic diseases are some the risk factors. Retropharyngeal abscess, and hepatic/subdiaphragmatic abscess, pneumonia, penetrating trauma, surgical wounds, osteomyelitis, perivalvular abscess rupture in

Figure 2 CT thorax showing pericardial effusion.

Figure 3 Chest X-ray after drainage of pericardial fluid.

endocarditis, oesophageal rupture with fistula formation and seeding from circulating bacteraemia are some of the sources of pyopericardium.⁷⁻⁹ The diagnosis is usually made by echocardiography and the drainage of pus from the pericardial cavity. Electrocardiography findings in pericardial effusion are subtle, insensitive and nonspecific, and the presence of ST segment elevation is suggestive of pericarditis.^{9 10} CT and MRI of thorax also aid in the diagnosis.³ Clinically, Beck's triad comprising hypotension with narrow or weak pulse pressure, muffled heart sounds and raised jugular venous pressure is indicative of cardiac tamponade. However, less than 30% of cases exhibit the full triad.¹¹ Typically small effusions accumulate quickly and tend to produce tamponade. Large effusions, on the other hand, undergo slow accumulation of fluid, thereby allowing the pericardial sac to expand.¹² Treatment is by drainage of pus, which may be done by pericardiocentesis, surgical pericardial window or pericardiectomy, along with antibiotic therapy. Though pericardiocentesis may be sufficient, the recurrence of effusion will require pericardiectomy or pericardial window.

Our patient was a known diabetic and had immune thrombocytopenia. She was on oral steroids, even though her platelet counts were near normal and there were no bleeding manifestations. She presented with fever and pericardial effusion with no evidence of any primary infection. She had *Staphylococcus* septicaemia, which did not improve to antibiotics alone. On

Learning points

- ▶ Pyopericardium is an uncommon condition, and pericardial effusion in the presence of fever should raise its suspicion.
- ▶ Though haemodynamically stable patients do not require pericardial fluid drainage, intervention should be done if pyopericardium is suspected, as this can progress to tamponade despite antibiotic therapy.
- ▶ Small pericardial effusions are more prone to develop tamponade; hence, clinicians should be more cautious.
- ▶ Patients with pericardial effusion progressing to tamponade may not present with all features of Beck's triad.
- ▶ Treatment of immune thrombocytopenia with immunosuppressive drugs should be restricted to those with moderate or severe thrombocytopenia, who are bleeding or at risk of bleeding.

progression to tamponade, she underwent pericardial drainage through window, following which she recovered.

Contributors MG: revision of manuscript and treating physician. RGM: concept and design of manuscript, revision of manuscript and treating physician. HN: critical revision of manuscript and treating cardiothoracic surgeon. JFJ: critical revision of manuscript and treating cardiologist.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

© BMJ Publishing Group Ltd (unless otherwise stated in the text of the article) 2018. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

REFERENCES

- 1 Spicer RL, Ware SM. Diseases of the pericardium. In: Kliegman RM, Stanton BF, St Geme JW, Schor NF, Richard E, *et al.* eds. *Nelson textbook of pediatrics*. 20th edn. Philadelphia: Saunders Elsevier, 2016:2279–80.
- 2 Imazio M, Brucato A, Mayosi BM, *et al.* Medical therapy of pericardial diseases: part I: idiopathic and infectious pericarditis. *J Cardiovasc Med* 2010;11:712–22.
- 3 Krassas A, Sakellariadis T, Argyriou M, *et al.* Pyopericardium followed by constrictive pericarditis due to *Corynebacterium diphtheriae*. *Interact Cardiovasc Thorac Surg* 2012;14:875–7.
- 4 Kodan E, Tadera T, Ubuki C, *et al.* A case of slowly progressive purulent pericarditis in an elderly healthy woman. *J Gen Pract* 2014;2:149.
- 5 Bhaduri-McIntosh S, Prasad M, Moltedo J, *et al.* Purulent pericarditis caused by group A *Streptococcus*. *Tex Heart Inst J* 2006;33:519–22.
- 6 Lange RA, Hillis LD. Acute pericarditis. *New England Journal of Medicine* 2004;351:2195–202.
- 7 Little WC, Freeman GL. Pericardial disease. *Circulation* 2006;113:1622–32.
- 8 Sagristà-Sauleda J, Barrabés JA, Permanyer-Miralda G, *et al.* Purulent pericarditis: review of a 20-year experience in a general hospital. *J Am Coll Cardiol* 1993;22:1661–5.
- 9 Hall IP. Purulent pericarditis. *Postgrad Med J* 1989;65:444–8.
- 10 Meyers DG, Bagin RG, Levene JF. Electrocardiographic changes in pericardial effusion. *Chest* 1993;104:1422–6.
- 11 Reeves S. Pericardiocentesis. In: King C, Henretig FM, eds. *Textbook of pediatric emergency procedures*. 2nd edn. Pennsylvania: Lippincott Williams and Wilkins, 2008:710–4.
- 12 Saito Y, Donohue A, Attai S, *et al.* The syndrome of cardiac tamponade with "small" pericardial effusion. *Echocardiography* 2008;25:321–7.

Copyright 2018 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.

BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow