

Sterno-bronchial fistula – an extremely rare complication after coronary artery bypass grafting

Przetoka mostkowo-oskrzelowa: niezwykle rzadkie powikłanie po chirurgicznej rewaskularyzacji wieńcowej



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Abstract

The incidence of complications following temporary epicardial pacing wires implantation remains low. Although rare, their late results may be unfavorable for the long-term operative outcome. The authors present a case of a 53-year-old male who developed a deep peristernal infection complicated by the formation of a sterno-bronchial fistula. Diagnosis, course, and possible causative factors are discussed. Retention of epicardial pacing wires as well as lung pleura laceration due to inadvertent metallic suture handling may play a role in the formation of sterno-bronchial fistula. We recommend a classic fistulography, with a simple drain fixed in the entry of the skin fistula as a route to administer the contrast medium, the diagnostic tool of choice while considering the above diagnosis.

Key words: coronary artery bypass, sternotomy, complications, sternobronchial fistula.

Streszczenie

Choć powikłania związane z pozostawieniem elektrod nasierdziowych do czasowej stymulacji nie są zbyt częste, to mogą w istotny sposób pogorszyć odległe wyniki leczenia chirurgicznego. Autorzy przedstawiają przypadek 53-letniego mężczyzny, u którego rozwinęła się głęboka infekcja mostka w postaci przetoki mostkowo-oskrzelowej. W pracy omówiono proces diagnostyczny, przebieg leczenia, a także poddano dyskusji czynniki etiologiczne. Zdaniem autorów zarówno pozostawione elektrody nasierdziowe, jak i uszkodzenie mięszu płuca podczas zakładania szwów metalowych na mostek mogą być odpowiedzialne za wystąpienie przetoki mostkowo-oskrzelowej. Klasyczna fistulografia z wykorzystaniem ufiksowanego w przetoce drenu jest rekomendowanym przez nas, prostym i skutecznym narzędziem diagnostycznym.

Słowa kluczowe: pomostowanie aortalno-wieńcowe, sternotomia, powikłania, przetoka mostkowo-oskrzelowa.

Introduction

Although the epicardial pacing wires are considered the standard in the diagnosis and treatment of dysrhythmias following cardiac surgery, its implementation is not independent from the potentially serious complications [1, 2]. We present a case of post – coronary artery bypass grafting (CABG) peristernal wound infection complicated by mediastinal fistula communicating with the right bronchial tree, which might be due to the retention of temporary epicardial pacing wires.

Case report

A 53-year-old male was referred to our Department in April 2008 due to evolving symptoms of unstable angina. His diagnosis of quadruple – vessel coronary artery disease, hyperlipidemia and arterial hypertension was confirmed

and a surgical treatment plan was settled. His medical history revealed an anterior wall myocardial infarction two years before the admission. Neither obesity nor features of diabetes mellitus were found. The left ventricular function was preserved (LVEF 55%) and the Logistic EuroSCORE was 3.1%. Due to the patient's condition an emergency on – pump CABG was performed. One arterial [left internal thoracic artery (LITA) to left anterior descending (LAD)] and three venous [saphenous vein graft (SVG) to IM, right coronary artery (RCA) and OM] aorto-coronary bypasses were implanted. The atrial and ventricular temporary epicardial pacing wires were placed due to bradycardia and unsatisfactory cardiac output. The sternum was closed with the aid of six metallic sutures – five simple wires and one figure-of-eight. The early postoperative course was complicated by low cardiac output syndrome which required continuous infusions of inotropic

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agents, antidysrhythmics and institution of intra-aortic balloon pumping (IABP). Over the period of five days, the patient's condition stabilized allowing us to discharge him on the ninth postoperative day.

On the discharge sternum was stable and the wound completely healed. His follow-up visit took place eight weeks later. The patient's condition was unremarkable and post sternotomy wound did not display any signs of infection.

One month later, the patient was admitted to the general surgery ward after he had been diagnosed with soft tissue abscess in the lower aspect of the wound. The patient presented with the subscapular back pain and concomitant fever up to 39°C.

Within the period of twelve months, the patient was hospitalized several times due to peristernal pain, fever, and suspicion of pneumonia. Along this period, multiple, recurrent skin abscesses with several fistulas at the lower part of the sternum were observed. The patient was treated with three courses of antibiotics, given both orally and parenterally. None of this gave durable effect. A year after the initial procedure the patient was readmitted to our unit. The responsible pathogen was identified as

methicillin sensitive *Staphylococcus aureus* (MSSA). Under general anesthesia two metallic sutures were removed from the lower sternum, and the surgical debridement was performed. Infection was treated according to the antibiogram. Soon after, a resolution of the inflammation was observed.

One month after, a follow-up CT revealed a pacing wire situated correctly on the right atrium wall and purulent discharge with CT – visible gaseous bubbles forming a right peristernal abscess. Several days later, a new onset of skin fistula at the upper part of the sternum was encountered.

During the routine abscess cavern irrigation with an antiseptic fluid, the patient had a cough salvo and expectorated. Suspicion of the bronchial tree fistula was made at this point. Although gastrofiberscopy, bronchoscopy and CT were performed no confirmation was obtained. On the classic fistulography, after the water soluble contrast medium was injected to the skin fistula at the lower aspect of the sternum, the contrast medium filled not only the lower peristernal area but also the right bronchial tree (Fig. 1). In the projection of purulent canal communicating the skin with the bronchial tree, the shadow of the atrial epicardial pacing wire could be observed (Fig. 2). On the

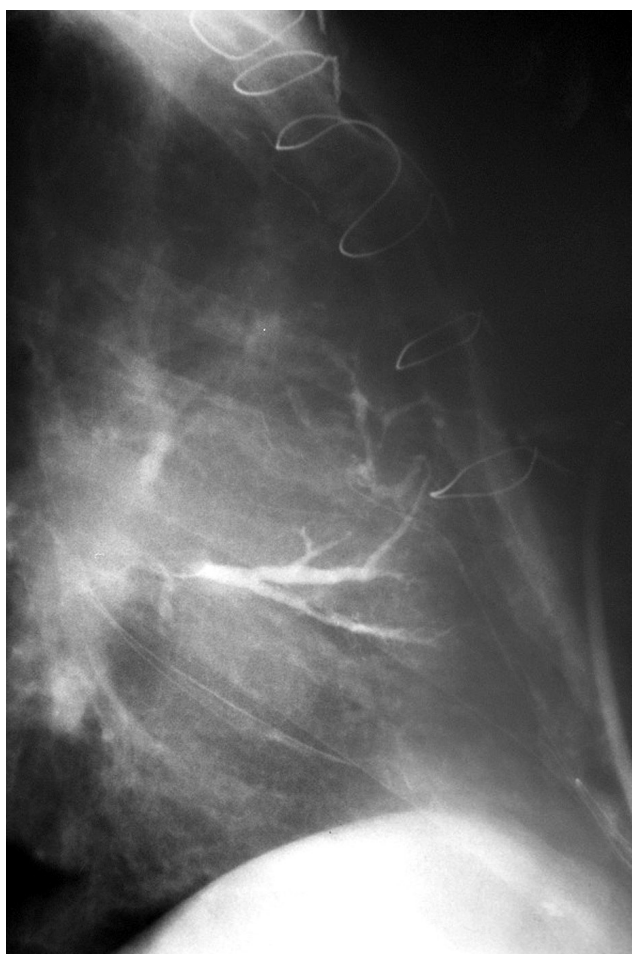


Fig. 1. Communication between the skin fistula and the right bronchial tree visualized by means of classic fistulography – a lateral film



Fig. 2. Shadow of the epicardial pacing wire visible in the sterno-bronchial fistula projection. Contrast in the right bronchus and trachea – a classic fistulography

same day all epicardial wires were explanted under the local anesthesia. With the help of CT scans the tips of electrodes were explored beneath the xiphoid process and retracted. A follow-up diagnostics revealed complete resolution of the infection and inflammation. To the present day, the patient remains asymptomatic.

Discussion

Mandak *et al.* were the first to report the case of a sterno – bronchial fistula due to sternal wound infection [1]. Sakellaridis T. and colleagues presented the second case [2]. To our best knowledge the above case is the third.

Patophysiology of the sterno-bronchial fistula remains unclear. No data are available to support the thesis that the epicardial wires and/or metallic sternal sutures are responsible for the formation of the fistula. We find it peculiar, that the infectious process can migrate from the pericardial sac to the bronchial tree without disseminating to the pleural cavity. It is also surprising that in all three cases MSSA was cultured, and named an etiologic factor of the entity. Above that we argue with the functioning name of the entity which suggests that the sternum is involved in the inflammatory process. Surprisingly in all three cases the peristernal tissue was involved, but the sternal bone remained untouched.

All epicardial pacing wires were explanted under the local anesthesia, as we feared that residual communication between the bronchial tree and the pericardial sac may cause a pneumopericardium with the symptoms of the acute tamponade during the positive pressure ventilation.

To our content this simple procedure produced the awaited outcome with no further complications.

In contrast to previous reports, our patient was managed by open explantation of pacing wires whereas in the other cases this was not performed due to lack of the patient consent in one case and the poor clinical status in the other. Previous reports did not specify the treatment results. The twelve – month long follow – up of our patient was longer than any in the remaining reports hence permanent resolution of the symptoms might be suggested.

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