The Journal of Tehran University Heart Center

Photo Clinic

A Forgotten Bulldog Clamp during a Coronary Artery Bypass Surgery

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Received 09 April 2023; Accepted 16 June 2023

A 64-year-old man was admitted to our hospital for chest pain. His previous medical history revealed hypertension, diabetes mellitus, and percutaneous coronary intervention (PCI) because of coronary artery disease. His physical examination was unremarkable. A 12-lead electrocardiography demonstrated normal sinus rhythm. Transthoracic echocardiography (TTE) showed a left ventricular ejection fraction of 50%. Additionally, the coronary angiography revealed a patent left main artery and 3 vessel disease. Therefore, the patient was candidated for elective on pump coronary artery bypass graft surgery. Under general anesthesia with standard monitoring, conventional median sternotomy was performed. In addition to the left internal mammary artery and saphenous vein grafts anastomosis of left coronary artery, a saphenous vein graft was anastomosed to right coronary artery (RCA). Subsequently, the patient was rewarmed and weaned off Cardiopulmonary bypass (CPB) without any problem. The operation was uneventful, and the patient was transferred to the open heart intensive care unit, where a portable chest radiograph (CXR) was immediately obtained. The CXR revealed a bulldog clamp on RCA (Figure 1-A). The patient was immediately transported to operative room. Under general anesthesia, the chest was opened via sternotomy again. The bulldog clamp was removed from the artery (Figure 1-B). After surgery, the patient was transferred to the open heart intensive care unit again. Immediately, another CXR was immediately obtained. The chest radiograph showed no abnormality. He was finally discharged home in a good overall condition. Although the forgotten foreign bodies (FBs) are rare after cardiac surgery, it is a serious problem. The most frequently foreign bodies are gauze pads, catheter pieces, surgical instruments and their parts. The rate of forgotten foreign bodies is one in 7000 surgeries.[1, 2]

They are usually diagnosed incidentally, or found on workup relating to complications of the FBs.[1-3] There are several modalities to detect the bulldog clamp on vessel such as ECG monitor, 12-lead ECG, Transit-Time Flow Measurement (TTFM) and chest x-ray in cardiac surgery. The ECG monitor is not a good tool to detect the bulldog clamp on vessel during

J Teh Univ Heart Ctr 2023;18(3):232-233

This paper should be cited as: Tarbiat M, Salimbahrami SAR, Rezaei M, Khorshidi HR. A Forgotten Bulldog Clamp during a Coronary Artery Bypass Surgery. J Teh Univ Heart Ctr 2023;18(3):232-233.

Keywords: *Coronary artery bypass; Foreign bodies; Radiography, thoracic*

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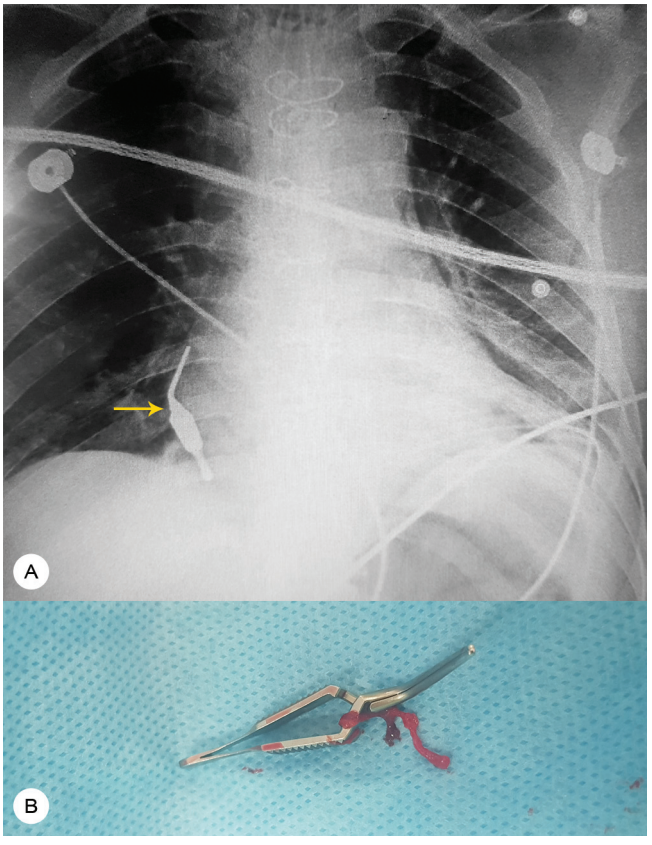

Figure 1. The images display a bulldog clamp before and after removal of it from the chest of the patient.
A) Portable CXR showed a forgotten bulldog clamp on RCA (Arrow) in view, and B) the bulldog clamp after surgical removal in view.
CXR, Chest radiograph; RCA, Right coronary artery

surgery, especially in patient which has stable hemodynamic parameters or previous dysrhythmia. The 12-lead ECG usually is used in intensive care unit (ICU), not during surgery. It has same limitations like ECG monitor. Transit-Time Flow Measurement (TTFM) is an intra-operative tool to assess the patency and the quality of a graft in order to prevent errors from going unnoticed. It has a lack of clear cut-off values and the varying sensitivity and specificity of each parameter to predict graft patency. A major issue for TTFM is low sensitivity to reliably detect graft failure. It also may increase the costs and duration of the procedure.[4,5] The CXR is still an easy and essential tool for the early diagnosis for some of them. Postoperatively, the portable CXR is generally immediately obtained in the ICU. It has a high specificity for metal FBs such as bulldog clamp. Although there are no standard guidelines for management of them, symptomatic cardiac FBs or FBs with complications should be removed. The surgical approaches generally thoracotomy or median sternotomy with and without CPB. The forgotten surgical material generally leads to increased costs and a bad reputation for clinicians and treating institutions. Both the all assisting personnel and the surgeon have a great responsibility in this regard. Although the bulldog clamp did not result any serious complication in the present case, however, FBs may sometimes cause a foreign body reaction, infection, dysrhythmia or hemodynamic compromise.[1-3] Therefore, the all operative team should be aware of this serious malpractice and carefully check operative checklist. In addition, the instrument and material carefully counting after surgery and before sternal closure will have avoided this major problem. Untimely, it must be noted that the portable CXR is still a reliable tool for the early diagnosis of some forgotten surgical materials, especially for FBs such as metal bulldog clamp.

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