

Hemothorax after chest tube insertion for pneumothorax as a complication of clopidogrel

Case Report

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Abstract: Hemorrhagic complications are recognized when anti-platelet agents are used during or after surgical procedures. We present a 69-year-old male patient who developed hemothorax after chest tube insertion for pneumothorax as a complication of clopidogrel and aspirin following ischemic heart disease. Hemothorax associated clopidogrel has rarely been reported and this is the first academic publication of this complication type following chest tube insertion shortly after the cessation of clopidogrel. Our case demonstrates the possibility of hemothorax when chest tube insertion is indicated under such conditions.

Keywords: Hemothorax • Chest tube insertion • Complication • Clopidogrel

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1. Introduction

Clopidogrel, one of the anti-platelet agents and is a potent adenosine diphosphate receptor blocker that irreversibly inhibits platelet aggregation by preventing the activation of the glycoprotein IIb/IIIa pathway [1]. Clopidogrel, along with aspirin, is recommended in the American College of Cardiology/American Heart Association guideline [2] and, therefore, an increasing number of patients suffering from cardiovascular diseases are treated with them. Clopidogrel treatment at the time of certain procedures increases the risk of significant bleeding complications [3-5]. Although very rare, emergency surgical procedures may be necessary for patients taking anti-platelet agents.

Hemothorax has been reported as a complication of chest tube insertion, which can require surgical hemothorax and removal of the bloody clot in pleural space [6] [7]. We report herein a successfully treated case with hemothorax after chest tube insertion for pneumothorax as a complication of clopidogrel and aspirin.

2. Case report

A 69-year-old male patient was referred to our hospital due to sudden onset of shortness of breath. He had a 40-year history of diabetes mellitus and received coronary stent implantation due to ischemic heart disease 3 years ago. Thereafter, he was prescribed clopidogrel (75mg/day) and aspirin (100mg/day). Physical examination on admission showed decreased respiratory sound and dullness to percussion at the right lung. Complete blood count on admission was: Hemoglobin (Hgb) 14.2 g/dL, white blood cell count (WBC) 9800/ μ L, and platelet count (Plt) 18.6×10^4 / μ L; The prothrombin time was 13.4 sec, and the activated partial thromboplastin time was 35.6 sec. Chest radiograph revealed pneumothorax of the right (Figure 1). Clopidogrel and aspirin were stopped, and small bore intercostal catheter was inserted considering the effect of these drugs. In proper placement lead to removal of the catheter. Thereafter, 20 Fr large bore chest tube was replaced (Figure 2). During the insertion procedure of the chest tube, bleeding was not observed. Almost twelve hours after the procedure, he

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Figure 1. Chest radiograph on admission revealed pneumothorax of the right.

suddenly experienced cold sweating. He was pale with dullness to percussion at the right lung again. At this time, Hgb was 8.1 g/dL, WBC 10700/ μ L, and Plt 15.5 $\times$ 104/ μ L. Chest tube was obstructed by blood, chest CT scan showed deterioration of right pneumothorax and medium amount of fluid in right hemithorax (Figure 3-A, B). Additional 20 Fr large bore chest tube was inserted and achieved improvement of hemopneumothorax, but no further surgical treatment was required. The chest tubes were left in place for 9 days as they continued to drain blood-stained fluid, with a constant daily decrease.



Figure 2. Chest radiograph soon after 20 Fr large bore chest tube replacement.

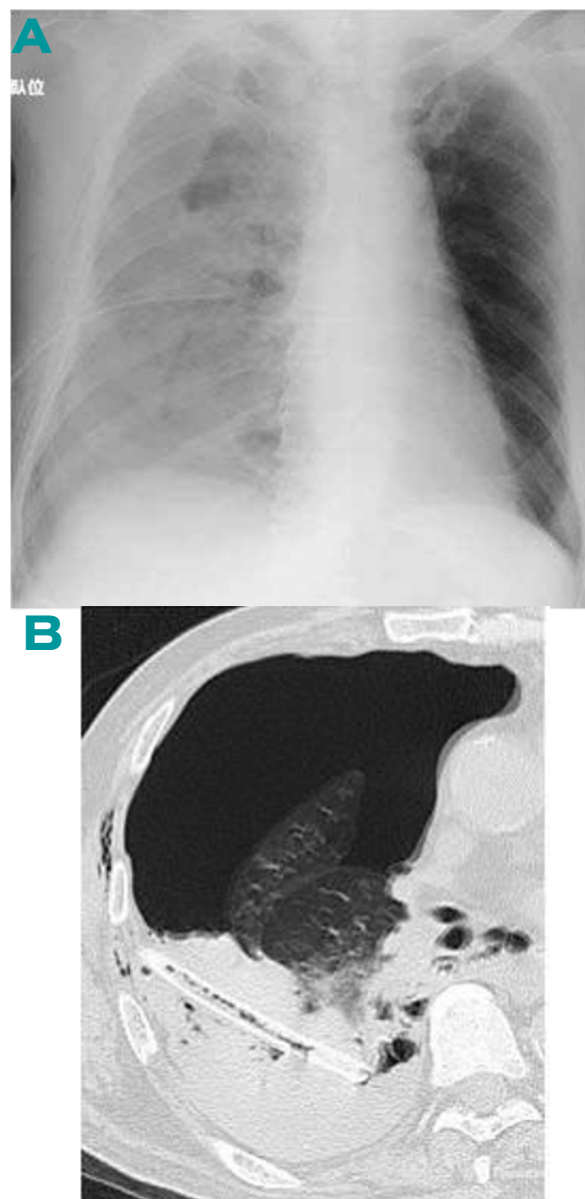


Figure 3. Chest radiograph at the time of deterioration of hemopneumothorax with mediastinum shift (A), and chest CT scan, which indicated bloody clot in the chest tube inserted and deterioration of pneumothorax with medium amount of pleural fluid (B).

Chest radiograph and CT scan showed regression of the hemopneumothorax, although small amount of interlobar fluid was observed (Figure 4). The patient was discharged 19 days after the development of the pneumothorax. At the time of discharge, Hgb was 10.6 g/dL and Plt 16.6 $\times$ 104/ μ L.



Figure 4. Chest radiograph at the time of discharge, which showed regression of hemopneumothorax, although small amount of interlober fluid was observed.

3. Discussion

An increasing number of patients requiring coronary stent implantation receive anti-platelet agents [8]. Continuing anti-platelet agents may increase procedure-related bleeding complications [3-5]. In emergency situations, some interventional procedures have to take place under or shortly after the cessation of anti-platelet treatment, despite the increased bleeding risk. In elective surgery, prescription of anti-platelet agents must terminate approximately one week before the procedures [5]. In acute respiratory failure due to severe pneumothorax, however, we cannot wait for a week until the disappearance of the effect of anti-platelet agents. An anti-platelet agent, clopidogrel is at times prescribed with aspirin as dual anti-platelet therapy [9]. Our patient had chest tube insertion placed under this dual anti-platelet therapy, and developed hemopneumothorax after the insertion of chest drainage tube. Deterioration of respiratory condition might mainly be due to that of pneumothorax as significant mediastinum shift to the left side was observed on chest CT scan. This was developed by the insufficient drainage effect of bloody clot in the chest tube inserted.

Not many data are available on the bleeding complication risks in patients receiving anti-platelet agents at the time of some procedures [3-5]. As the cause of hemothorax, clopidogrel has been reported in 3 cases [10-12]. Haro Estarriol et al reported one hemothorax case after coronary angioplasty and stenting with clopidogrel therapy to treat unstable angina [11]. Shennib et al reported one case among 135 off-pump coronary artery bypass grafting patients [12]. Boulé et al performed a retrospective case-control study to evaluate whether clopidogrel increases bleeding complications in patients undergoing heart rhythm device procedures [10]. In the study, one patient receiving clopidogrel had a hemothorax after subclavian puncture [10].

The complications of chest tube insertion and drainage is not common, but can be life threatening [6,7]. Among the complications, hemothorax may develop with tears of the intercostal vessels proximal to chest tube insertion or injury of pleura with sharp metal trocars during the procedures of insertion. However, data on the incidence of hemothorax in patients under anti-platelet treatment, with respect to chest drain insertion or removal, are limited. To our best knowledge, there has been no hemothorax case with anti-platelet agents including clopidogrel.

In this case, initial chest radiographs showed marked improvement of pneumothorax with no air-fluid levels, which suggest that bleeding might not occur at a time of chest tube insertion. Hemothorax was not associated with tears of the intercostal vessels in this case, but it would be possible that there was blood oozing due to tissue injury proximal to chest tube inserted. Whether other anti-platelet agents carry an additional risk of the complications compared with clopidogrel is not apparent, however, hemothorax occurred no other precipitating factor was present than clopidogrel in our patient. It was unclear why the intrathoracic bleeding terminated in our patient. We suppose that bleeding site was not the injury which surgical suture was not required, and that hemorrhagic effect of clopidogrel was lessened after the termination of the drug in a week.

In summary, chest tube insertion must be performed in certain emergency conditions under anti-platelet treatment. Although the fact that patients on antiplatelet drugs have higher risk of bleeding complications during any invasive procedure is well-known and obvious fact, clopidogrel treatment at the time of chest tube insertion may be associated with an increased risk of hemothorax, and clinicians should be alert on such a complication.

References

- [1] Mood GR, Bhatt DL. Clopidogrel and risk for acute coronary events. *Curr Atheroscler Rep* 2007; 9: 401-408
- [2] Pollack CV Jr, Antman EM, Hollander JE; American College of Cardiology; American Heart Association. 2007 focused update to the ACC/AHA guidelines for the management of patients with ST-segment elevation myocardial infarction: implications for emergency department practice. *Ann Emerg Med* 2008; 52: 344-355
- [3] Trawick EP, Yachimski PS. Management of non-variceal upper gastrointestinal tract hemorrhage: controversies and areas of uncertainty. *World J Gastroenterol* 2012; 18: 1159-1165
- [4] Cook-Norris RH, Michaels JD, Weaver AL, et al. Complications of cutaneous surgery in patients taking clopidogrel-containing anticoagulation. *J Am Acad Dermatol* 2011; 65: 584-591
- [5] Chernoguz A, Telem DA, Chu E, Ozao-Choy J, Tammaro Y, Divino CM. Cessation of clopidogrel before major abdominal procedures. *Arch Surg* 2011; 146: 334-339
- [6] Menger R, Telford G, Kim P, et al. Complications following thoracic trauma managed with tube thoracostomy. *Injury* 2012; 43: 46-50
- [7] Yacovone ML, Kartan R, Bautista M. Intercostal artery laceration following thoracentesis. *Respir Care* 2010; 55: 1495-1498.
- [8] Garg R, Uretsky BF, Lev EI. Anti-platelet and anti-thrombotic approaches in patients undergoing percutaneous coronary intervention. *Catheter Cardiovasc Interv* 2007; 70: 388-406
- [9] Sharma S, Forrester JS. A novel regimen of alternate day clopidogrel would provide a cost-effective strategy to prevent very late stent thrombosis. *Med Hypotheses* 2012; 78: 166-170
- [10] Boulé S, Marquié C, Vanesson-Bricout C, et al. Clopidogrel increases bleeding complications in patients undergoing heart rhythm device procedures. *Pacing Clin Electrophysiol* 2012; 35: 605-611
- [11] Haro Estarriol M, Alvarez Castillo LA, Baldó Padró X, Palou Rispau A, Rubio Garay M, Rubio Goday M. Bilateral hemothorax secondary to combined antiplatelet therapy with clopidogrel and acetylsalicylic acid. *Arch Bronconeumol* 2006; 42: 307-309
- [12] Shennib H, Endo M, Benhameid O. A feasibility study of the safety and efficacy of a combined clopidogrel and aspirin regimen following off-pump coronary artery bypass grafting. *Heart Surg Forum* 2003; 6: 288-291