Acta Med. Nagasaki 65: 131－133

Case Report

Surgical treatment for therapy-related pectoral hematoma: report of a case and review of published reports

Takuro Miyazaki, Tomoshi Tsuchiya, Keitaro Matsumoto, Ryoichiro Doi, Koichi Tomoshige, Satoshi Mizoguchi, and Takeshi Nagayasu

Department of Surgical Oncology, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

A 96-year-old man with a rapidly growing right chest wall mass was referred to our department for further treatment. Enhanced chest computed tomography showed a huge pectoral hematoma (12×6 cm) in the right thorax. He was on oral antiplatelet medication, but no abnormalities in clotting ability were detected. Because the hematoma was enlarging and painful, it was evacuated surgically and hemostasis achieved around the pectoral branches of the thoraco-acromial artery. His postoperative course was uneventful with no evidence of subcutaneous fluid retention. Surgical hemostasis and hematoma evacuation of this pectoral hematoma might be effective as one treatment method.

ACTA MEDICA NAGASAKIENSIA 65: 131－133, 2022

Key words: pectoral hematoma, anti-coagulant therapy, surgery

Introduction

Understandably, chest trauma and invasive medical procedures such as cardiac surgery and catheterization [1,2] sometimes cause pectoral hematomas. Blood thinners can precipitate development of such hematomas [3-9]. Notably, many older patients take anti-platelet and anti-coagulation drugs to prevent venous thromboembolism after cardiac artery, mechanical valve surgery, or atrial fibrillation, and so on. Bleeding is as one of the most significant and serious complications of anti-thrombotic drug use. We here report a case of surgically-treated therapy-related spontaneous pectoral hematoma and review published reports on this rare condition because the risk of developing such hematomas may increase with the increasing use of antiplatelet and anticoagulant drugs.

Case

A 96-year-old man with a rapidly enlarging right chest wall mass was referred to our department for further investigation and treatment. His medical history included Parkinson's disease and coronary artery bypass grafting. He had been taking the clopidogrel 75mg since undergoing that procedure. Two days before transfer to our hospital, he reported mild right-sided chest pain after performing upper extremity exercises in a nursing home. This symptom did not increase thereafter; however, two days later, a 3-cm mass that enlarged to around 10 cm in the subsequent few hours was noted on the right chest wall. Enhanced computed tomography in our hospital showed a huge mass (12 × 6 cm) that was diagnosed as a pectoral hematoma (Figure 1a); however, there was no obvious extravascular leakage of contrast agent (Figure 1b). Relevant laboratory findings included hemoglobin 9.6 g/dl, platelet $266 \times 10^3/\mu$l, activated partial thromboplastin time

Address correspondence: Takuro Miyazaki, MD, PhD
Department of Surgical Oncology, Nagasaki University Graduate School of Biomedical Sciences, 1-7-1 Sakamoto, Nagasaki 852-8501, Japan
Tel: +81-95-819-7304; Fax: +81-95-819-7306; E-mail: miyataku@nagasaki-u.ac.jp

Received January 24, 2022; Accepted January 31, 2022

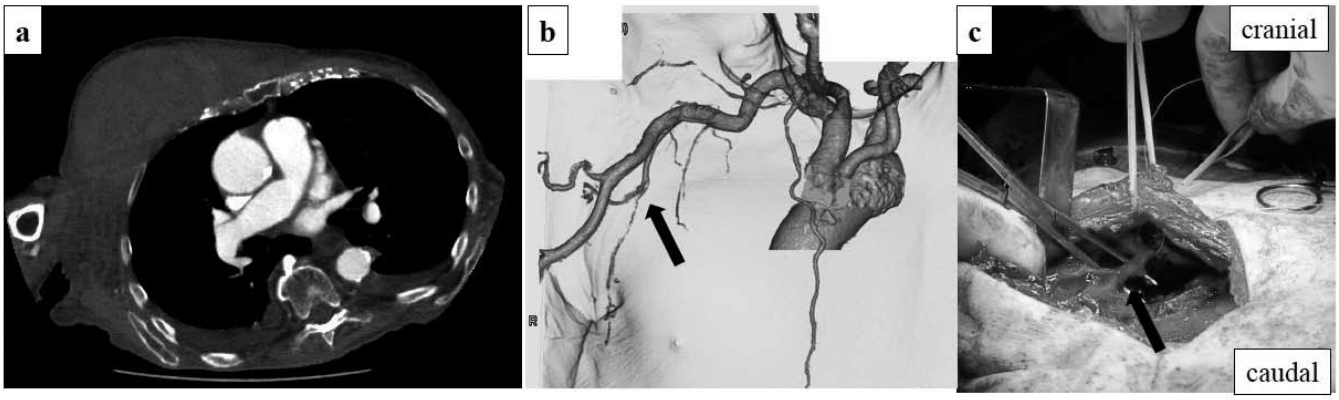

Figure 1.
(a) Enhanced chest computed tomography image showing a large mass in the right chest wall. White arrows: hematoma
(b) Three-dimensional angiography image. Arrow: pectoral branches of thoraco-acromial artery.
(c) Operative findings. Arrow: pectoral branches of thoraco-acromial artery

23.8 seconds, international normalized ratio 0.99, total serum bilirubin 1.0 mg/dl, aspartate aminotransferase 13 U/l, alanine aminotransferase 7U/l, blood urea nitrogen 22 mg/dl, and creatinine 0.95 mg/dl. No abnormalities in coagulation capacity or evidence of hemorrhagic shock were identified. Because of the rapid enlargement of the hematoma and accompanying pain, it was surgically evacuated and hemostasis of the pectoral small branches of the thoraco-acromial arteries (Figure 1c) and veins by ligation and electrocautery, in addition to suturing the pectoralis major muscle tightly. No muscle tearing was observed. The operation time was 141 minutes and total blood loss 387 mL (including the hematoma). After surgery, clopidogrel was discontinued permanently. His postoperative course was uneventful and he was discharged on eighth postoperative day with no evidence of subcutaneous fluid retention.

Discussion

This report describes the successful surgical treatment of pectoral hematoma associated with the antiplatelet drug treatment and probably minor pectoral muscle damage during exercises. With the aging of populations and consequent increasing numbers of comorbidities, the use of anti-thrombotic therapies will likely continue to increase. We therefore believe it is important for clinicians to recognize evidence of bleeding early, including that occurring in atypical locations.

We have summarized the findings in previously reported cases (10 patients) of therapy-related pectoral hematoma from 2008, including the current case, in Table 1. The patients comprised seven men and three women of average age 79 years. They had various comorbidities that required anti-thrombotic therapy, including coronary artery disease, cerebral

Table 1. Reported cases of therapy-related pectoral hematoma

Year	Reference	Age	Sex	Cause of pectoral hematoma	comorbidity	Size of hematoma on chest CT (cm)	hemorrhagic shock	Treatment
2008	[9]	81	Male	Anti-thrombotic therapy (enoxaparin)	DVT	25 × 15	Yes	Surgical evacuation
2010	[6]	86	Male	Anti-thrombotic therapy (clopidogrel+aspirin+intravenous heparin)	CVD	7.2 × 6.2	No	Conservative
2010	[8]	72	Female	Anti-thrombotic therapy (Warfarin) + lifting obese patietns	HVD	17 × 12	No	Conservative
2012	[3]	81	Male	Anti-thrombotic therapy (clopidogrel)	CAD, CVD	NA	No	Conservative
2013	[5]	78	Male	Anti-thrombotic therapy (Warfarin+ aspirin)	CAD, Af	NA	Yes	Conservative
2016	[4]	79	Female	Anti-thrombotic therapy (Warfarin)	CHF, HVD	14.7 × 14.2	Yes	Conservative
2016	[7]	66	Male	Anti-thrombotic therapy (Warfarin)	CAD, CHF, Af	12 × 11	Yes	Conservative
		80	Female	Anti-thrombotic therapy (Warfarin)	CAD, Af	18 × 14	No	Conservative
		71	Male	Anti-thrombotic therapy (Warfarin)	CAD, DVT	3.8 × 1.5	No	Conservative
2021	Our case	96	Male	Anti-thrombotic therapy (clopidogrel) + rehabilitation	CAD	12 × 6	No	Surgical evacuation

Af: Atrial fibrillation, CAD: Coronary artery disease, CHF: Chronic heart failure, CVD: Cerebral vascular disease,
DVT: Deep vein thrombosis, HVD: Heart valve disease.

vascular disease, and atrial fibrillation. Other possible therapy-related causes included minor muscle damage during loaded exercise (lifting obese patients and rehabilitation of the upper limb) in two (20%) cases. Care should be taken in older patients taking oral anti-thrombotic drugs because the slightest damage can result in bleeding and formation of a hematoma.

Although coagulation was impaired in many of the reported cases, it has been difficult to stop the bleeding in some patients with activated partial thromboplastin time and international normalized ratio within the normal range, as was true in our case. The average maximum size of the reported hematomas on chest computed tomography was 13.7 cm (range 3.8–25). Four (40%) of the ten cases were in hemorrhagic shock (hypotension, anemia requiring rapid infusion of fluid and blood). Although some of the reported patients appeared to be in a serious condition, many (80%) required only conservative treatment, including cold compresses and firm bandaging over the hematoma, rapid fluid infusions, blood transfusion, frequent checks of hemoglobin concentrations, and discontinuation of anti-thrombotic therapy.

Detailed operative findings for the patients treated surgically were not reported [9]. We were unable to identify any active bleeding points in the pectoral branches of the thoraco-acromial artery or the lateral thoracic artery. As others have described, because the axillary vein is within a compartment filled with loose connective tissue, pectoral hematomas associated with axillary vein catheterization can expand from the lateral thorax to the pectoralis muscles [10]. Additionally, as suggested in one report about an older patient, pectoral hematomas can arise from partial rupture of the pectoralis major in uremic patients taking anti-thrombotic therapy [6]. We speculate that oozing from small veins and minor muscle damage caused our patient's pectoral hematoma. Though our patient's postoperative course was uneventful, after reviewing relevant published reports, we realized that we could have avoided surgery. However, we believe that no surgical treatment had some limitations related to pain management from huge hematoma, and longer hospitalization to wait for disappearance of huge hematoma, which might impair the patients' quality of life. Finally, it is important to note that spontaneous hematomas can occur in other parts of the body. Hematomas in the iliopsoas, rectus, and lower extremity muscles have also been reported [8]. Thus, it should always be kept in mind that this rare condition can result from intramuscular bleeding.

This report describes the successful surgical treatment of a spontaneous pectoral hematoma associated with anti-thrombotic therapy. It is important to remain aware of the possibility of hematomas in older patients taking anti-thrombotic therapy

Acknowledgments

We thank Edanz Group (https://en-author-services.edanzgroup.com/ac) for editing a draft of this manuscript.

Conflict of Interest

The authors declare no conflicts of interest associated with this report.

Funding

No funding was used to support this study

References

1. Vetrugno L, Muzzi R, Giordano F. Pectoral muscle hematoma after axillary artery catheterization in a patient undergoing minimally invasive mitral valve surgery. J Cardiothorac Vasc Anesth. 2007; 21: 96-8.
2. Hsu CC, Lin CY, Tsai Y Da, et al. Hemorrhagic shock caused by intramuscular hematoma of the pectoralis major after CPR. Am J Emerg Med. 2016; 34: 682.e5-6.
3. Cakar MA, Kocayigit I, Aydin E, et al. Clopidogrel-induced spontaneous pectoral hematoma. Indian J Pharmacol. 2012; 44: 526-7.
4. Koklu H, Koklu NO, Aksoy Khurami F, et al. Therapy-related spontaneous pectoral muscle hematoma: a case report and review of the literature. J Am Geriatr Soc. 2016; 64: 1135-7.
5. Patel N, Baker SM, Modrykamien A. Hemorrhagic shock due to spontaneous pectoral hematoma associated with anticoagulation therapy. J Gen Intern Med. 2013; 28: 1673.
6. Tasai H Bin, Kuo CC, Huang JW, et al. An 86-year-old man with a unilateral pectoral swelling. Neth J Med. 2010; 68: 183.
7. Yang JC, Makaryus AN. Warfarin anticoagulation and spontaneous pectoral haematomas. Heart Lung Circ. 2016; 25: e81-4.
8. Çinar N, Şahin Ş, Karaoğlan A, et al. Intramuscular hematomas caused by anticoagulant therapy: Is advanced age a risk factor? Noro Psikiyatr Ars 2010; 47: 267-70.
9. Ozpolat B, Yazkan R, Aksoy M, et al. Spontaneous pectoral hematoma secondary to enoxaparin for the treatment of deep venous thrombosis in an elderly man. Anadolu Kardiyol Derg 2008; 8: E40
10. Shinzato T, Fukui M, Kooguchi K, et al. Hemorrhagic shock 3 days after catheterization from the axillary vein. J Anesth. 2010; 24: 290-2.