

Title: An Intrathoracic Scapular Prolapse with Hemorrhagic Shock after a
Thoracotomy

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Abstract:

We herein present a case in which an emergency operation was performed for an intrathoracic hemorrhage resulting from a scapular prolapse after a thoracotomy, a rare complication of this procedure. A 59-year-old man had undergone a right upper lobectomy with an extended resection of the posterior chest wall including the second to fourth ribs due to a direct invasion by a lung cancer. On postoperative day 80, we performed an emergency operation as the patient had gone into shock due to an intrathoracic hemorrhage with a right scapular prolapse. The scapula protruded through the enlarged fourth intercostal space. The prolapsed scapula was reduced and the defect in the chest wall was covered with Marlex mesh.

Key words: scapular prolapse; intrathoracic hemorrhage; thoracotomy; chest wall resection

Text:

Introduction:

An intrathoracic scapular prolapse is a rare complication of a thoracotomy.

We herein present a case study of a patient who required an emergency operation for an intrathoracic hemorrhage. This had resulted from a scapular dislocation into the pleural cavity following a previous right upper lobectomy with a chest wall resection for lung cancer.

Case report:

A 59-year-old man underwent a right upper lobectomy in our institute in June 2007, involving an extended resection of the posterior chest wall including the second to fourth ribs, to treat a stage IIIA lung cancer. We performed this procedure via a posterolateral incision and a fourth intercostal thoracotomy. The latissimus dorsi, anterior serratus, trapezius, and rhomboid muscles were all cut during the thoracotomy, and subsequently sutured when closing the chest. The dorsal portion of the fifth rib was additionally cut during the procedure, and the cutting site was fixed with a poly-L-lactic acid pin. During the surgery, we did not use any sutures

for additional fixation of the rib cutting site. The fourth intercostal space was fixed by suturing the fourth and fifth ribs using absorbable sutures. The defect size in the chest wall was approximately 7 cm on the anteroposterior axis and 9 cm on the craniocaudal axis. This defect was not covered however because we considered that it had a relatively small range and would be completely covered by the scapula. After surgery, we restricted the right shoulder movement of the patient for two weeks. The patient subsequently underwent adjuvant radio-chemotherapy in our affiliated hospital. At around postoperative day 60, the patient reported a right shoulder pain and a scratching sensation when he raised his right arm. He received follow-up observations without treatment because his symptom was not serious. On postoperative day 80 however, he suddenly went into hemorrhagic shock and was transported to our hospital by ambulance.

A chest computed tomograph revealed an intrathoracic prolapse of the right scapula and a large right pleural effusion (Figure 1). The patient underwent an emergency operation which revealed that the inferior angle of the right scapula had protruded into the pleural cavity through the chest wall defect resulting from the previous surgery. Moreover, the fixing pin of

the fifth rib had detached, and the fourth intercostal space had enlarged. In addition, the pleural cavity was filled with considerable bloody effusions and coagulated blood. The total amount of bleeding was approximately 1,500 g, but we could not detect the bleeding point. We reduced the prolapsed scapula and cut the inferior angle of the scapula to prevent a further relapse. The dehiscent site of the fifth rib was secured with another pin and ligated with absorbable sutures for further fixation[1]. In addition, the chest wall defect, including the fourth intercostal space, was covered with Marlex mesh folded into four layers. The postoperative course was uneventful and the patient could raise his right arm with no discomfort after this corrective second surgery. Currently, the patient is undergoing a course of chemotherapy due to a local recurrence of his cancer in the chest wall.

Comments:

Intrathoracic prolapse of the scapula is a rare complication of a thoracotomy procedure but has been reported in a number of previous case studies [2-5]. Gould et al. listed weakness and deformity of the shoulder, debilitation, the administration of steroids, and abnormal shoulder movement as the likely

causes of the scapula prolapse in their reported case [3]. Weakness and deformity of the shoulder girdle have been previously described after routine thoracotomy [6, 7]. We also contend that this was one of the causes of scapular prolapse in our present case. The anterior serratus, trapezius, rhomboid, and even latissimus dorsi muscles, which were cut during the first surgery in our present case, influence the scapular positioning, stability, and movement [8]. In addition, our present case was debilitated after his first surgery due to radio-chemotherapy.

The chest wall defect in our current case was enlarged after the first surgery because the fifth rib had deviated caudally and the scapula was prolapsed through the defect space. We speculate that the inferior part of the scapula caused this caudal displacement of the fifth rib during shoulder movement. It is possible that additional fixation of the rib cutting site by sutures could prevent this dislocation of the fifth rib. Moreover, when large defects are situated on the posterior chest wall caudal to the fourth rib, reconstruction of the chest wall should be performed to prevent a scapular prolapse [9]. Hence, if we had performed a chest wall reconstruction during the first surgery, the scapular prolapse might not have occurred.

An intrathoracic hemorrhage supervened the scapular prolapse in our present case and we could not find any previous description in the literature of a similar occurrence. During the emergency surgery in our current case, no hemorrhagic effusions or blood clots were evident in the extrathoracic space. Hence, we speculated that the dislocation of the scapula would have caused injury to the soft tissues and vessels of the chest wall and induce hemorrhaging into the pleural cavity, although a bleeding point was not clearly detectable during the procedure. In addition, it is possible that the vessels of the chest wall were fragile and prone to bleeding in our present case due to radiation-induced vascular injury [10].

With regard to treatment of a scapular prolapse, Gould et al. have reported that they performed closed reduction because of their patient's poor physical condition, which slowly resolved the shoulder pain, but not the shoulder movement restriction [3]. Palissery et al. presented a case of scapular prolapse which was initially reduced by closed manipulation, but the dislocation proved to be unstable and required an operative reduction and a chest wall repair [5]. In our present case, we performed an operative reduction because an intrathoracic hemorrhage was associated with the

scapula prolapse, and the symptoms were completely resolved after the surgery. These findings led us to speculate that a closed reduction will be of limited effectiveness as a treatment for a scapular prolapse and that an operative reduction should instead be used if the patient can tolerate the surgery.

In conclusion, when a resection of the posterior chest wall is performed, a chest wall reconstruction should also be undertaken to prevent a scapular prolapse. Moreover, if patients report shoulder pain after a thoracotomy, sufficient care must be taken to investigate the possibility of a scapular prolapse and intrathoracic hemorrhage.

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Figure legends:

Figure 1:



(Left panel) Chest computed tomograph demonstrating a dislocation of the right scapula in the right pleural cavity (arrowheads). The fifth rib (arrow) is located dorsally to the scapula.

(Right panel) Sagittal reconstitution of the above computed tomograph showing herniation of the inferior part of the right scapula (arrowheads) and a massive pleural effusion.