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Case Report

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Chemotherapy delivering port catheter fracture and migration into the heart: a life-threatening accident during neck dissection

Abstract

Objectives: port catheter fracture and migration could be an iatrogenic life-threatening complication. We aimed to sensitize head and neck surgeons to this complication.

Observation: a 61-years old man was referred to our surgery department for management of T3N0M0 laryngeal cancer after failure of preservative treatment. The patient had received 2 cycles of chemotherapy and was judged a bad responder. A total laryngectomy with bilateral neck dissection was indicated. The port catheter was kept in place for possible further chemotherapy treatment. During neck dissection the catheter fractured and migrated. Post operative CT scan showed the distal part of the catheter bulging in the right cardiac chambers. The patient was transferred to an interventional cardiology unit where the foreign body was successfully retrieved using femoral venous access.

Conclusion: port catheters are a real potential danger because of the risk of fracture and migration of the distal part. Removal of these devices should be performed in collaboration with medical care oncologists before every neck intervention.

Keywords: port catheter, chemotherapy, neck dissection, fracture, migration

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Abbreviations: ENT, ear, nose, and throat; ETD, eustachian tube dysfunction; ABV, alternobaric vertigo; GERD, gastroesophageal reflux; LPR, laryngopharyngeal reflux; NPR, nasopharyngeal reflux

Introduction

Implanted central venous devices also known as port-catheters are increasingly used in oncology to administrate chemotherapy drugs. Despite being an elegant solution to deliver a long-term toxic treatment, these devices could become a potentially life-threatening danger. Catheter fracture is a rare but serious accident occurring in 0.1 to 1% of patients.[1,2] Migration of the distal part in the heart cavities may result in serious complications leading to heart arrest and even death.[3,4] Usually, this accident happens spontaneously due to material fatigue or malfixation of the port. Here we report a rare case of cardiac migration of a port catheter inadvertently sectioned during total laryngectomy and neck dissection in a port-catheter patient. The foreign body was immediately extracted after surgery through femoral vein access in an interventional cardiology unit. The main objective was to sensitize head and neck oncologist surgeons to this avoidable potentially lethal complication and to explain the main causes leading to catheter fracture.

Case report

A 61-years old man with a medical history of diabetes mellitus and hypertension followed for T3N0M0 laryngeal cancer was admitted to our department of head and neck surgery for surgical management after the failure of conservative treatment. The patient had previously received 2 cycles of Docetaxel-cisplatin-5-fluorouracil-based chemotherapy and was judged a bad responder. The port catheter was kept in place thinking the patient might need additional chemotherapy cycles. A total laryngectomy with bilateral neck dissection was performed. Intraoperatively, when moving the catheter during neck dissection, the device fractured and the distal part migrated in the internal jugular vein. Digital palpation of the vessel didn't identify any foreign body. The operation was carefully carried on after contacting radiologists for a prompt CT scan immediately after surgery. Postoperative radiological findings showed the distal part of the catheter budging in the right cardiac cavities (Figure 1).

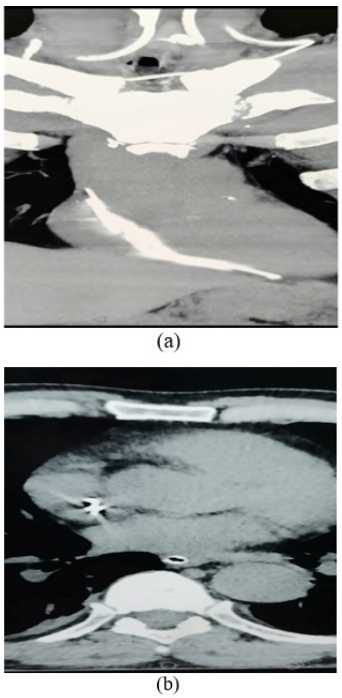

Figure 1 Thoracic CT scan coronal (a) and axial (b) sections showing the distal part of the catheter bulging in the right cardiac chambers.

The patient was transferred to an interventional cardiology unit where the foreign body was retrieved using femoral venous access

(Figure 2). Postoperative follow-up was uneventful. The patient was discharged 12 days after surgery.

Figure 2 The retrieved distal part of the catheter.

Discussion

The sclerosing action of chemotherapy drugs in peripheral vessels is well documented. Since the 80's implantable port catheter have been increasingly used in oncology offering more comfort for patients needing long-term chemotherapy treatment.[5] A port catheter is usually placed on the right side of the chest under the skin facing the ribs. A reservoir is attached to a catheter that is threaded to the superior vena cava via the internal jugular vein or the subclavian vein. Despite its advantages, implanted devices have been associated with many complications.[6–8] The reported overall complication rate is between 13% and 17%.[7,9] Catheter occlusion, infection, malposition and thrombosis are the most common complications.[8] Catheter fracture and migration of the distal part is a relatively rare mechanical complication. According to Lin et al, the incidence of port rupture was 2.17%; all ports were inserted via the subclavian vein.[10]

Unlike this case, most cases of catheter fracture and migration occurred spontaneously.[6,11,12] To our knowledge, no similar cases of intraoperative fracture and migration of port catheters were recorded. Camilleri reported a case of an aberrant central catheter found and retrieved during neck dissection for malignant head and neck cancer.[13] The catheter was inserted during the surgical intervention via the antecubital fossa to monitor central venous pressure.

Material fatigue and degradation are one of the most admitted causes. In fact, this complication was more prevalent in the 70's and 80's.[14] Nowadays, catheter manufacturing is based on stable materials such as cathoflex (polyurethane) and silicone (polysiloxane) which both are resistant to environmental stress cracks and catheter fracture.[15] Malfixation of the port, inappropriate movements of the catheter and local infections were also reported as risk factors.[16]

According to Wu et al, the subclavian route is significantly associated with catheter rupture.[17] Catheter implanted via the subclavian vein passes in a narrow space between the first rib and the clavicle and is more likely to fracture due the compression.[10] It's called ''the pinch of'' syndrome.[6] In our institution, all catheters are inserted via the internal jugular vein route. Laterally inserted catheters following this route had fewer complication rates.[17]

Depending on the gravity and length of the fragmented catheter, superior vena cava-right atrium, right atrium-inferior vena cava, right-atrium-right ventricle and right atrium-hepatic vein are the usual migration sites of catheter fragments.[14] After migration of port catheter in cardiac chambers, most patients remain asymptomatic.[6] Some patients presented unspecific signs like thoracic pain and palpitations.[12] However, this accident could lead to severe complications such as vessels and heart perforation, endocarditis, cardiac rhythm disorder and pulmonary artery thrombosis.[14]

Percutaneous retrieval of the catheter using femoral vein access is the gold standard and successful method in the majority of cases.[18] The reported success rate of endovascular retrieval in the literature reached 94%.[19] Due to the potentially fatal complications, extraction of the foreign body by open thoracotomy is needed in case of failure of percutaneous retrieval.[18]

Conclusion

Nowadays implanted central venous devices are widely used. Catheter fracture and migration are unpredictable and present a real life-threatening danger. Retrieval of the foreign body may require an invasive approach notably an open thoracotomy. Head and neck surgeons should be aware of this avoidable complication. Its prevention passes through a preoperative removal of the port catheter should be performed in collaboration with the medical care oncologist before every neck intervention.

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Conflicts of interests

Authors declare no conflict of interests.

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