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Port catheter fracture and migration in Internal Jugular Vein

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Summary

Background:

Central venous access devices for chemotherapy are being used extensively in patients with cancer. Spontaneous fracture and migration of the catheter is uncommon. We present the uncommon occurrence of a fracture and spontaneous migration of the fragment into the internal jugular vein as a delayed complication of a central venous access catheter implanted for chemotherapy administration.

Case Report:

A patient with Ewing's sarcoma of the humerus with metastasis in the lungs underwent placement of a totally implantable venous access device. The port was in place for 1 year. The patient presented with pain in the right side of the neck. A chest X-ray demonstrated complete transection of the catheter and migration of the catheter fragment in the internal jugular vein. Both the migrated catheter fragment and the proximal part of the catheter were retrieved surgically. He had an uneventful recovery.

Conclusions:

Catheter fracture remains a potential complication, which must be recognized and treated promptly. Periodic chest imaging is recommended for detection and timely removal of the catheter.

key words:

venous port system • chemotherapy • fracture • migration • internal jugular vein

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BACKGROUND

Central venous access devices for administration of chemotherapeutic drugs are being increasingly used in patients with oncological diseases. These devices enable long-term chemotherapy in patients with cancer [1–7]. Spontaneous fracture of the catheter and migration of a catheter fragment is a rare complication [8]. The incidence of catheter fracture in recent series varies from 0.4% to 1.8% [3,9]. The catheter fragment may migrate and finally lodge in the vena cava, right atrium, right ventricle, or the pulmonary artery and its branches [10–12]. Migration into the internal jugular vein is rare [2]. We report a case of spontaneous fracture of the port catheter and its migration into the internal jugular vein, managed surgically.

CASE REPORT

A 24-year-old male was diagnosed with Ewing's sarcoma of the right humerus in 2005. He received local radiation with the VACIE regimen. He was in remission until 2008 and then developed metastasis in the lungs. He received 6 cycles of chemotherapy with EFT protocol. A totally implantable central venous access device (Venous Port, Baxter) was placed via the right subclavian vein using the standard technique to allow administration of chemotherapy. One year after implantation of the venous access device, the patient complained of pain in the right side of the neck. A chest X-ray revealed fracture of the chemoport and the migration of the fragment in the right internal jugular vein (Figure 1). The migrated fragment was retrieved through the neck surgically under fluoroscopic monitoring. The port was also removed at the same time (Figure 2). The postoperative course was uneventful. A CECT chest and abdomen done in March 2010 showed multifocal patchy consolidation in bilateral lungs suggestive of progressive disease, for which he received 2 injections of trabectedine.

DISCUSSION

Delayed complications of venous access devices are spontaneous intravascular fracture of the catheter, catheter dislocation and embolisation, and spontaneous migration and thrombosis of the internal jugular vein [2,13]. Port-system fracture is rare and the reported incidence is 0.4% to 1.8% [1,7]. Various factors which have been implicated for port fracture are type of port used, site of placement, type of chemotherapy, and duration of catheter use. Rupture of the catheter most frequently occurs in the space between the clavicle and the first rib at the point of entrance of the catheter into the vein. This is the typical site, as the mechanical friction against the catheter is greatest here. The compression can cause transient obstruction of the catheter and may result in a tear or even complete transection and embolization of the catheter [14]. Lin et al. [7] have reported the most frequent location of fracture at the proximal port-anastomosis between the injection port and the catheter in 93.2% of cases, and the middle part in 6.8%. A recent study has shown a difference in rupture rates related to the material used. Higher resistance of silicone catheters resulted in less frequent rupture as compared to polyurethane catheters [15]. Fillipou et al. [3] found no correlation of port fracture with the type of chemotherapy administered.

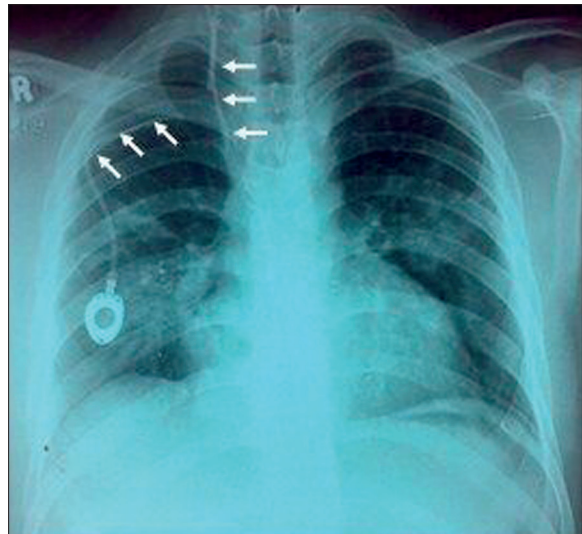


Figure 1. Chest X-ray showing catheter fragment in the internal jugular vein. The remainder part is seen in the right upper chest.



Figure 2. The fractured catheter and the port removed by means of open technique.

Subclavian vein access has been the recommended approach for placing central venous catheters. In view of the complication of a fracture owing to the compression of the catheter in the costoclavicular space [6], some recommend an internal jugular vein approach [8], or a cephalic vein access technique [7,11]. When the catheter is implanted via the cephalic vein, the shearing effect on the catheter is less marked [15]. However, in a randomized trial Biffi et al. [1] reported that central venous insertion site had no impact on the complication rate.

Various factors that have been implicated for migration are vigorous movements of the upper arms, neck flexion, and change of thoracic pressure with coughing and vomiting [2]. We could not speculate on the cause of migration in our patient.

These patients may be asymptomatic [2,7,16] or may have severe signs. The reported presentations are infraclavicular pain, paraesthesia in the arm, cardiac arrhythmias, palpitation, swelling, or resistance to infusion [4,7,14]. Serious complications of catheter fracture include migration of the

catheter fragment and extravascular administration of cytotoxic drugs [11]. The embolised catheter fragment may travel to the right atrium, ventricle, or internal jugular vein and may result in myocardial perforation, perforation of the vein, migration into mediastinal structures, internal jugular vein thrombosis, and pulmonary artery pseudoaneurysm [4,10,17]. The most common location of fractured fragments is between the superior vena cava and the right atrium [18]. In the present case the segment had migrated into the internal jugular vein and the patient presented with neck pain.

Early detection of the complication is important for management. A regular follow-up chest X-ray is important, as most patients (66%) develop fracture within 1 year. The earliest radiographic indication of impending catheter fracture is a pinch-off sign – the catheter is indented as it passes beneath the clavicle [14]. The pinch-off sign is reported to occur in 1% of long-term subclavian catheters, with a 40% estimated risk of fracture [18]. Prevention may be possible by using the internal jugular vein approach or a more lateral approach through the subclavian vein [8,14].

Early removal of the catheter fragment is recommended. The options to retrieve the catheter fragment are surgical intervention [3,11] or percutaneous endovascular techniques [6,18]. We retrieved the catheter via a venotomy of the internal jugular vein under image guidance.

CONCLUSIONS

Fracture with migration is a rare complication that must be recognized and managed promptly. A chest X-ray is recommended for early detection. Catheter fatigue from prolonged use contributes to fracture and the catheter should be removed when it is no longer needed.

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