CASE REPORT

Fracture and migration into the coronary sinus of a totally implantable catheter introduced via the right internal jugular vein

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SUMMARY

There has been an increase in the use of totally implantable devices. Catheter fractures are rare but known complications. This case report presents a rare migration site of the catheter fragment into the coronary sinus. The totally implantable catheter was introduced into the right internal jugular vein to deliver chemotherapy. Although it was an unusual site, the catheter fragment was removed without complications using loop-snare technique.

CASE PRESENTATION

A 41-year-old man diagnosed with colon adenocarcinoma, underwent retosigmoidectomy and resection of liver metastases. To deliver chemotherapy, a totally implantable catheter (Bard 8 Fr portcath) was introduced in May 2011 into the right internal jugular vein by posterior access with the aid of ultrasound (figure 1).

After 24 months, the patient had cervical pain and bulging during a saline flush. A chest radiography was performed (figure 2), which showed the proximal portion of the catheter but not its distal part. A CT scan of the chest showed almost every fragment of the catheter within the coronary sinus and a small portion in the right atrium (figure 3).

TREATMENT

The catheter fragment was removed under local anaesthesia and sedation using the loop-snare

Figure 2 Chest radiography showing the proximal portion of the catheter but not its distal part.

technique via the right femoral vein. There were no complications during the procedure. The patient was discharged the next day and did not present any problems arising from this complication.

DISCUSSION

Totally implantable catheters are increasingly used in clinical practice, mainly for carrying out chemotherapy. Despite being safe, they are not without risk. The most common complication is bacteraemia associated with the catheter. Other non-infectious complications such as thrombosis, malfunction, extrusion of the reservoir and migration of the catheter tip have a much lower incidence.^{1 2} Although infrequent, catheter fractures should not be overlooked as they can generate several risks depending on the location of the migration.

Fractures may occur at the connection between the port and the catheter or at the catheter tip.³ There is no specific cause for the fracture of a catheter tip, but it is most likely the result of a combination of two factors: material with potential fatigue associated with excessive movement of a specific point of the catheter.

Regarding the material, it has been shown that silicon catheters are more resistant to fracture than polyurethane catheters.⁴ Regarding excessive movement at a particular point within the vessels, there are two known situations: the first and most important is the compression of the catheter between the clavicle and the first rib in the

Figure 1 Anteroposterior chest radiograph showing the port and the catheter after implantation.

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Figure 3 CT scan of the chest showing almost every fragment of the catheter within the coronary sinus and a small portion in the right atrium.

costoclavicular space (pinch-off syndrome) when access is established via highly medial puncture of the subclavian vein,⁵ and the second situation occurs when there is greater mobility of the catheter due to cervical motion in cases of higher internal jugular vein punctures.⁶ In our case, the puncture was performed in the internal jugular vein, 2 cm above the collarbone, which did not suggest any external mechanical factor leading to material wear. Probably the excessive mobility of the catheter was the cause for fracture.

When catheters fracture, they usually migrate to the atrium or to the right ventricle. Less frequently, as well as documented, they can migrate to the pulmonary and suprahepatic veins.³ Migration to the coronary sinus is very rare and has been reported only twice.^{7–8} This is the first case, to the best of our knowledge, reporting using the right internal jugular vein as access. This short and wide venous channel is considered the major vein of the heart and is located at the rear of the coronary sulcus. When migration to the coronary sinus occurs, it can be asymptomatic, as in our case, or it can generate precordialgia, ST elevation, pericardial effusion and cardiogenic shock. Its recognition is usually late, and when associated with thrombosis, it can cause death.⁹

Coronary sinus thrombosis is rare and is usually associated with interventional procedures such as the fitting of pacemakers, Swan-Ganz catheter placement, obtaining central access and ablations. This is the third case reported in the literature in totally implantable catheters.

Routine radiological examinations to monitor catheters are not performed; however, patients being treated with chemotherapy often undergo scans during follow-up for the underlying disease. In these situations, the catheters should be evaluated. To that end, a radiological grading has been described in which level 0 is used to demonstrate a normal image, level 1 when there is bending of the catheter, level 2 where there is narrowing and level 3 when there is fracture.¹⁰ Where abnormalities exist, catheter removal may be considered to avoid potentially serious complications. Our patient had a diagnosis of catheter fracture on radiography (level 3) and because the tip could not be seen, a CT of the chest was performed, which detected it within the venous sinus.

Owing to the risk of arrhythmias, septic complications and thromboembolism, the fragment should be removed as quickly as possible, which was the case for our patient. Removal of the fragmented catheter was performed with great ease by the percutaneous loop-snare technique via a femoral approach, which has proven to be effective and to have a low complication rate.¹¹ The femoral vein is the most commonly used in the literature, however, the internal jugular vein or the basilic vein could be considered, especially if the point is cranially towards superior vena cava.⁷ The procedure was performed using a

vascular sheath (6 Fr) to prevent injury to the vessel. A pigtail catheter (4 Fr) managed to pull the free end of the fragment from the right atrium to the inferior vena cava. It is easier to remove the catheter from a vessel compared to a chamber using a snare. The catheter fragment was caught with a loop-snare catheter (6 Fr). The retrieval catheter, foreign body and sheath were withdrawn as a unit.

Learning points

- ▶ Catheter introduced via jugular internal vein can be fractured.
- ▶ The coronary sinus is a possible migration site of the catheter fragment.
- ▶ Percutaneous loop-snare technique is effective and has a low complication rate.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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