CASE REPORT

Salvaging the chemoport using catheter-assisted deflection during stenting of the superior vena cava

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SUMMARY

Patients with malignancy who develop superior vena cava (SVC) obstruction may require stenting to relieve their symptoms. Some of these individuals also have an in-dwelling chemoport for concomitant chemotherapy. We present a case where stenting was accomplished after catheter-assisted deflection of the chemoport catheter tubing via a single groin access. It can save procedure time whilst salvaging the device.

INTRODUCTION

Symptoms of malignant SVC obstruction may be quickly and effectively relieved with stenting. Some of these patients have in-dwelling central venous lines for concomitant chemotherapy. There are several reports of central venous devices being intentionally displaced from their usual positions to facilitate stenting. In this article, we describe a case where stenting was achieved after temporarily deflecting the chemoport catheter tubing (CCT), both through the same groin access and without the need for a snare. This method can save procedure time and preserve the chemoport to permit on-going chemotherapy.

CASE REPORT

A 66-year-old lady with lung carcinoma developed SVC obstruction secondary to mediastinal lymphadenopathy. She had been receiving chemotherapy via a right arm chemoport. At presentation, she complained of worsening shortness of breath over the last 2 weeks. Computed tomography (CT) scan showed extensive hilar and mediastinal masses, the latter invading and narrowing the lower SVC. She was scheduled for urgent stenting of the SVC but developed respiratory distress shortly after being positioned supine on the angiography table, and was immediately intubated. We commenced the procedure, deciding to temporarily deflect the CCT out of the SVC using a catheter prior to stenting, thus enabling the entire process to be performed quickly via the same puncture site.

The right common femoral vein was accessed with a 7F sheath (Cook Inc, IN, USA). A 5F UHF Pigtail Performa catheter (Merit Medical Systems Inc, Utah, USA) was advanced into the right internal jugular vein. The cavogram confirmed narrowing of the lower SVC measuring approximately 4 cm in length. After winding a 5F Shepherd Hook catheter (Merit Medical Systems Inc, Utah, USA) around the CCT, the combination was successfully displaced into the right innominate vein (Figure 1). After this, a 14 x 80 mm Cordis SMART Control Nitinol Stent (Cordis Corporation, Florida, USA) was deployed in the SVC, down to the atrio-caval junction. A post-procedure cavogram was performed with the initial Pigtail catheter (Figure 2) before using it to reposition the CCT back into the SVC. Over the next 3 days, she was successfully extubated, transferred to the general ward and discharged well.

DISCUSSION

In the context of malignancy, the majority of SVC obstructions are associated with the tumour, in particular lung carcinoma, as well as prothrombotic tendency of the patient and presence of central venous devices.[1] Percutaneous SVC stenting is the fastest method to relieve symptoms, usually within 72 hours. The first successful stenting for malignant SVC obstruction was performed in 1986. It is sufficient to restore flow in either innominate vein to relieve symptoms.[2]

Any central venous device should be removed prior to stenting to avoid "sandwiching" its tip between the stent and vessel wall, potentially resulting in dysfunction.[1,3] Removal and subsequent re-insertion are not without procedural risks and increased healthcare cost.[1,4] This will be more pertinent for chemoports when compared to other central venous access devices, given that they are buried subcutaneously and necessitate excision whereas the latter may be more readily exchanged over a guidewire. Several reports exist in the literature describing techniques to salvage the chemoport during SVC stenting. On two occasions, snares were required to displace and maintain the tip of the chemoport within the innominate vein of the opposite side whilst SVC stenting was performed via the groin.[1,5] However, these entailed contralateral arm accesses. A single groin access was reported by Qanadli et al.[4] In their case, a snare was used only to deflect the tubing of the chemoport, before it was exchanged for the stent delivery system for SVC stenting. There are further two instances, one involving stenting of the SVC and unilateral innominate vein, and another where kissing stents were deployed in the SVC extending into both innominate veins.[2,3] Three access sites were needed in the former and an additional ipsilateral arm access in the latter. Snares were used both times.

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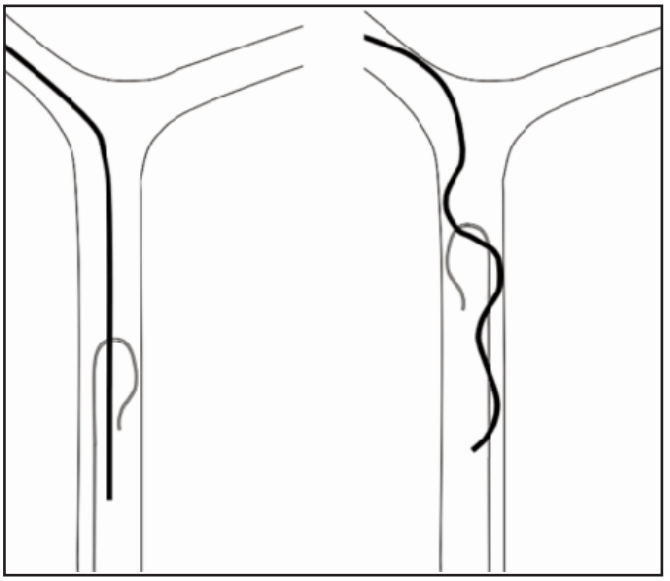

Fig. 1: A Shepherd Hook catheter was slid up the chemoport catheter tubing from below (left). It was then twirled around the tubing twice (720°) in order to exert sufficient traction (right) before displacing the intertwined combination into the right innominate vein.

Fig. 2: Post-procedure cavogram showing satisfactory stent position with good intra-luminal opacification and resolution of reflux into the azygos vein.

As our patient only required stenting of the SVC, we decided to perform both deflection and stenting via the same groin access. Instead of a snare, we utilised a reverse curve Shepherd Hook catheter. Attempts at deflecting the CCT directly or after a single twist of the catheter was difficult due to the slippery surfaces and lack of engagement. In order to gain sufficient traction, the catheter had to be twisted around the tubing twice before displacing the intertwined combination into the right innominate vein. Although the uninvolved SVC was capacious (with an average diameter of 15 mm in our patient) providing sufficient room for the catheter to be manipulated within, we caution against using excessive force during the engagement and deflecting stage to avoid vessel wall injury. We also opine that the 50% narrowing of the lower SVC due to malignant stenosis was beneficial in preventing easy dislodgement of the CCT back into that vessel. Additional arm access and snaring may be considered should the position of the deflected tubing be inadequately maintained. Otherwise, the operator runs the risk of the tubing dislodging just prior to deployment of the stent and getting "sandwiched" between the stent and vessel wall.

Given that a guidewire remained in the straight portion of the catheter to lend support, the catheter was more readily exchanged for the stent delivery system, thus saving time. It is crucial to avoid patient and table movement during this process, so that the stent can be promptly positioned and deployed. Once the upper end of the stent is released, dislodgement of the CCT is inconsequential, as it will now be within the stent lumen. Repositioning of the CCT was easily achieved by hooking the looped tubing and retracting it back into the SVC, as described by Chauhan et al.[6]

CONCLUSION

Catheter-assisted deflection of the CCT not only decreases procedure time, which is crucial in cases of SVC obstruction, but also permits salvage of the chemoport, so as not to disrupt chemotherapy. Furthermore, a reverse curve catheter is more economical than a snare. Even if a modified snare can be created from off-the-shelf equipment, this process requires extra time.[4] Finally, it does not preclude conventional methods if found to be unsuccessful. Given these reasons, catheter-assisted deflection is worth attempting first up.

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