Inferior Vena Cava Resection and Reconstruction for Tumoral Recurrence after Right Nephrectomy

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Abstract
We report a 60 years old patient who was admitted for a local recurrence after a right nephrectomy performed 2 years ago (papillary renal carcinoma with areas of sarcomatoid differentiation - pT3a). CT scan showed a retroperitoneal mass with invasion of the inferior vena cava. We performed a complete en-bloc excision of the tumor with the infrarenal portion of the inferior vena cava and lymphadenectomy. The vascular reconstruction was performed by the interposition of a 20 mm diameter Dacron prosthesis. The postoperative course was complicated due to an episode of digestive bleeding (duodenal ulcer) which stopped after conservative treatment (antisecretory and hemostatics, including rFVIIa), but eventually favourable. At 6 months follow-up the patient presents no sign of tumoral relapse and a functional vascular prosthesis. The case is interesting due to the rarity of the surgical procedure and the indication. The surgical approach of the retroperitoneal tumors with vascular involvement is possible in centers with adequate technical endowment and human expertise.

Key words: inferior vena cava, resection, reconstruction, recurrence after nephrectomy

Introduction
Advanced malignant lesions require often multivisceral resections in order to achieve a complete removal (1-3). Retroperitoneal tumors with inferior vena cava (IVC)
invasion remain a challenge for modern surgery due to the complexity of the procedure and the need to preserve the venous flow from the inferior part of the body. Despite the lack of clear guidelines, several retrospective studies suggest that in selected cases and experienced centers the resection and reconstruction of the IVC is safe and provides a chance for long-time survival in several retroperitoneal malignancies (4-8).

Case report

We report a 60 years old patient with a history of prostatectomy (benign hyperplasia) and right radical nephrectomy performed 2 years ago for a type 2 papillary renal carcinoma with areas of sarcomatoid differentiation (pT3a), which was not followed by any oncologic treatment. At two years after the nephrectomy the patient presented lumbar pain and nausea. CT scan showed a large retroperitoneal mass with invasion of the inferior vena cava (Fig. 1). After a multidisciplinary evaluation (general + vascular surgery, urology, oncology, anesthesia/intensive care) we decided to attempt a complete excision of the retroperitoneal mass.

The tumor was approached using an extended right subcostal laparotomy. After mobilisation of the right colon and a Kocher maneuver a retroperitoneal mass surrounding the IVC was identified and exposed. After partial dissection of the tumor at the upper and lower poles we dissected and isolated the IVC above and below the tumor, as well as the left renal vein and the aorta (Fig. 2A); this maneuver was considered mandatory for a safe future dissection (quick hemostasis in the event of a vascular lesion). The right renal artery stump was dissected and excised with lateral suture of the aortic wall. Due to the invasion of the posterior wall of the IVC a circumferential excision of the infrarenal segment was necessary in order to achieve macroscopic negative margins (Fig. 2B). The venous flow was reconstructed by the interposition of a 20 mm diameter Dacron prosthesis – 2 termino-terminal running suture anastomoses (Fig. 3). The total IVC clamping time was 39 minutes, which included the time required for the posterior mobilisation of the tumor which could be performed only after the sectioning of the IVC. Immediately after the clamping of the IVC the patient presented a drop of the blood pressure to 70 mmHg which was managed by volemic support. In order to reduce the risk of renal failure, the left renal vein was clamped only during the upper graft-to-IVC anastomosis.

The postoperative course was complicated due to an episode of digestive bleeding from a duodenal ulcer which stopped after conservative treatment (antisecretory and hemostatics, including rFVIIa), but eventually favourable. The patient was discharged at two weeks after surgery.

The pathological examination of the specimen confirmed the local recurrence – papillary renal carcinoma with areas of sarcomatoid differentiation. The patient received postoperative treatment with sunitinib malate (s manten). At 6 months follow-up the patient presents no signs of tumoral relapse and a functional vascular prosthesis (Fig. 4).

Figure 1. Preoperative CT scan (see text for details)
Discussions

Resection and reconstruction of the IVC is a difficult procedure which is performed rarely and in a small number of centers. In the absence of large series of patients there is no consensus concerning the indications and contraindications, surgical technique and the best material for vascular reconstruction (4, 5, 7, 9).

The main indication is represented by renal cancers with direct invasion or a tumoral thrombus extending in the venous lumen; the need to perform IVC resection may be usually anticipated with the use of modern imaging (10). In selected tumors with a stage T3b or greater achieving an R0 resection may often require an associated IVC resection, which is now considered to have an acceptable peri-operative morbidity and a reasonable oncologic outcome (11, 12).

Liver malignancies are another indication for IVC reconstruction.

Figure 2. (A) – intraoperative image after partial mobilisation of the tumor and dissection of the IVC, left renal vein and aorta. (B) – operative specimen showing the tumor and the resected IVC segment.

Figure 3. Reconstruction of the IVC by the interposition of a 20 mm diameter Dacron prosthesis.

Figure 4. Postoperative CT scan at 6 months after surgery showing no signs of tumoral recurrence and a functional vascular graft.
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References


