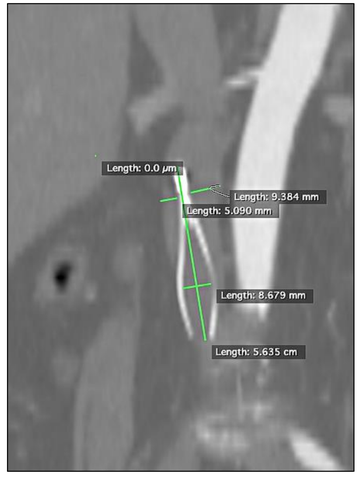
Mini-thoracotomy for mitral valve surgery in patients with caval filter

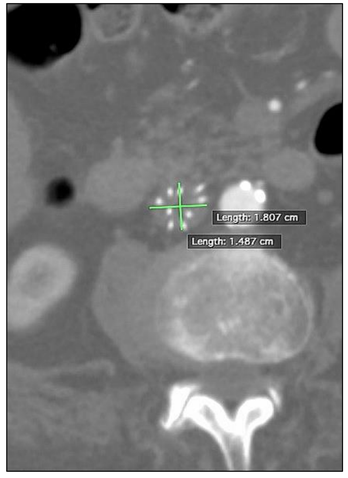
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Right mini-thoracotomy is increasingly preferred for mitral valve operations and is correlated with shorter recovery and postoperative hospital stay, less blood transfusions and re-exploration for bleeding, and better wound healing. Most often this approach implies peripheral femoral cannulation for cardiopulmonary bypass. The presence of a previously implanted caval filter may be viewed as a contraindication for transfemoral venous drainage.

Methods

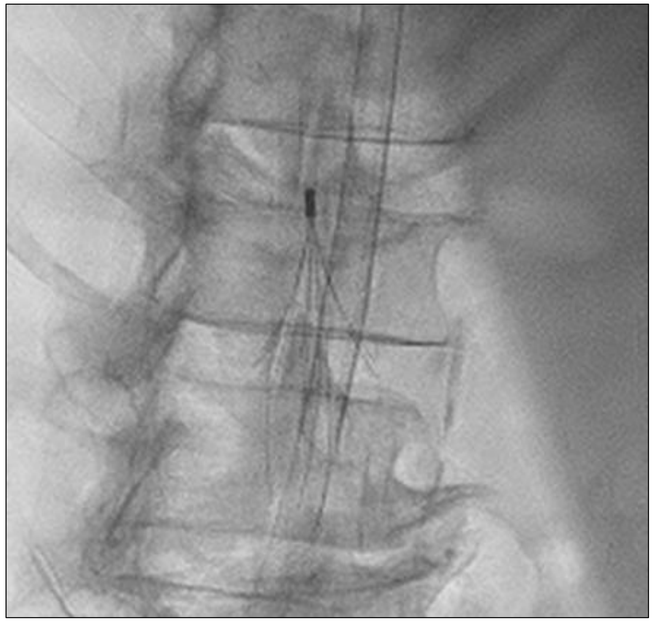
Hypothesizing that a caval filter could be crossed by an inferior venous cannula, surgical planning includes high-resolution computed tomography, in analogy to transcatheter valve implantation. Similarly, the operation is scheduled in a hybrid operating room with intraoperative angiography. Filter design and space between metal struts are assessed to adequately select cannula size. Separate transjugular superior caval drainage is provided.





Results

Two patients with a retrievable filter in place in the infrarenal vena cava (Figure) underwent mini-thoracotomy mitral surgery. Both presented with a complex history, including massive pulmonary embolism with secondary chronic pulmonary hypertension, requiring caval filter implantation and pulmonary thromboendoarterectomy with deep hypothermia and circulatory arrest. Several years thereafter, both were diagnosed with severe mitral regurgitation. In one patient, off pump posterior leaflet flail repair was attempted with transapical neochordae implantation, but regurgitation relapsed and the valve was re-repaired on cardiopulmonary bypass. The second patient underwent bioprosthetic valve replacement. In both cases, vacuum-assisted drainage on moderate hypothermia (30 °C) was provided and the filter was crossed smoothly by a 22-French cannula. No device dislocation was observed.



Conclusions

These cases highlight the feasibility of venous transfemoral cannulation for minimally invasive mitral surgery crossing a caval filter with no device dislocation. Filter design and space between the metal struts might limit this indication. Computed tomography coupled with intraoperative transesophageal echocardiography and angiography are pivotal for decision making and real-time monitoring during the procedure.