How I Do It: Aortic Cross Clamp At Time of Robotic Assisted Total Endoscopic Mitral Intervention

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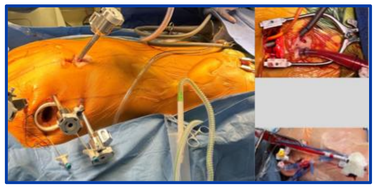
OBJECTIVE

Mitral valve repair by a robotic-assisted approach is growing on an international platform, but there remains the limitation of aortic cross clamping. We suggest a total endoscopic, reproducible approach to aortic cross clamping that allows the console surgeon to maintain control over the aortic cross clamp throughout the clamp process thereby reducing the requirements on the bedside assistant.

METHODS

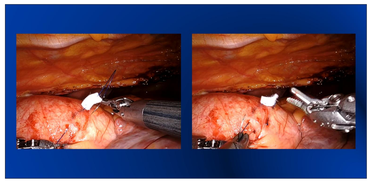
The Da Vinci Xi robotic system(Intuitive Surgical, Sunnyvale, CA) is employed, and the right chest is accessed in the standard fashion for mitral valve surgery utilizing port placement in the 3rd, 4th, and 5th interspaces and a 25mm access incision in the 4th interspace. After sufficient mobilization of the transverse sinus posterior to the ascending aorta, a Cygnet aortic cross clamp (Peters Surgical, Boulogne-Billancourt, FR) is introduced into the field. The reinforcement is released, and an aortic root purse string and catheter is placed. The clamp is secured with the assistance of the robotic instruments. At the completion of the intracardiac component of the operation, the clamp is readily released and removed from the field.

OPERATIVE PROCEDURE

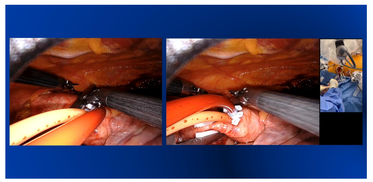


Patient is positioned supine with a bump under the right scapula with the right arm below the operative table.

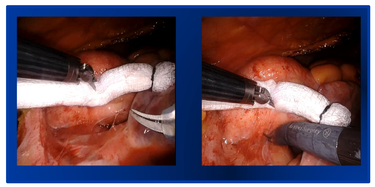
Right femoral arterial and venous cannulation and left IJ cannulation for CPB.



An aortic root purse string is placed for the root cardioplegia / vent using a pledgeted 3-0 polypropylene suture.

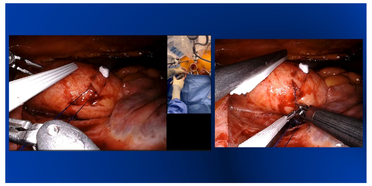


The clamp is positioned into final location by the console surgeon, and the bedside assistant closes the clamp.

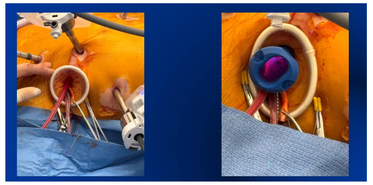


The transverse sinus is explored, and in this case has significant adhesions.

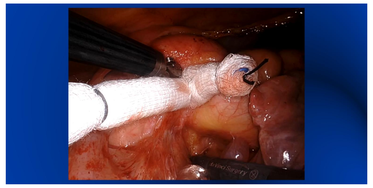
When adhesions are encountered, a robotic sponge and monopolar scissors are employed to develop the sinus completely.



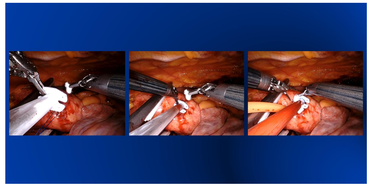
The aortic cross clamp is placed anterior to the aorta, opened and fixation released. It is then retracted by the assistant and allowed to fall into the transverse sinus with guidance by the robotic console surgeon.



The clamp, root vent and left ventricular vent are placed through the incision. A blue plastic trocar is then inserted to isolate the working field from the clamp and vents.



The transverse sinus is mobilized to allow safe and easy placement of the aortic cross clamp across the entirety of the aorta.



The antegrade needle is brought into the field and placed in the aorta, supported by the bedside assistant but placed by the robotic surgeon.

The catheter is stabilized by the surgeon while the assistant snares / secures at the bedside.

The root vent is stabilized by the console surgeon, and the cross clamp is released and removed by the bedside assistant after the intracardiac portion is completed.

CONCLUSIONS

Robotic mitral intervention is a rapidly growing operation; however, the ability to arrest the heart without an intra-aortic occlusion device remains challenging in a total endoscopic setting. We hereby present a technique to allow a bedside assistant to place an external aortic cross clamp in a total endoscopic fashion with the robotic console surgeon retaining control over clamp placement.

DISCLOSURES

A Luckert: Intuitive Surgical Solutions (Consultant)

NC Patel: Intuitive Surgical Solutions (Consultant), Vascular Graft Solutions (Advisory Board)

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