Aortic Valve Reimplantation Through Right Anterior Minithoracotomy with Totally Central Cannulation

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INTRODUCTION.

At our institution:

A. Isolated aortic valve replacement or repair have been routinely performed by **right anterior mini-thoracotomy (RAT)** for at least 10 years.

B. Our standard approach for aortic valve reimplantation (David procedure) includes superior mini-sternotomy and **totally central cannulation**.

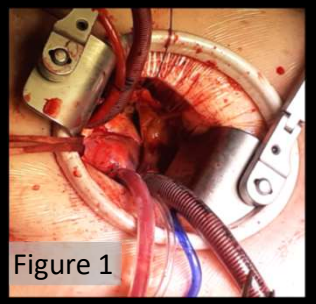
Based on it, from October 2020 we started to perform David operations through RAT, in order to combine advantages of such surgical access with the effectiveness of the aortic valve reimplantation procedure.

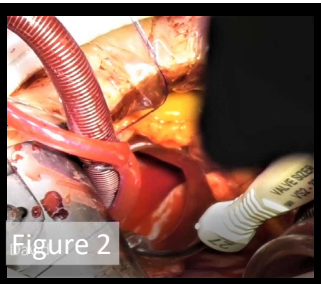
METHODS.

From 01-10-2020 we prospectively collected preoperative, intraoperative and in-hospital postoperative data from patients undergoing David procedure via RAT with totally central cannulation.

SURGICAL TECHNIQUE.

1. RAT at the 3rd intercostal space with 5-6 cm skin incision (see **Fig.7**), **avoiding rib damage and ITA injury**.
2. **Totally central cannulation** for **normothermic** cardiopulmonary bypass (inflow to the distal ascending aorta and outflow from the right atrium) (**Fig.1**) and cold St.Thomas-plus-blood cardioplegia enriched with prochaine.
3. Transcutaneous aortic cross-clamping with Chitwood clamp.
4. All procedures were performed using the neosinuses-dacron-graft **Cardioroot** (Getinge Group, Getinge, Sweden). The proper graft size was chosen by measuring the LVOT with a mechanical valve sizer, then adding plus 3 (**Fig.2**).
5. Positioning of the "U" stiches all along the virtual annular ring.
6. Measurement of the height of each commissure (**Fig.3**), then reporting it on the graft and drawing the entire suture line of the valve reimplantation (**Fig.4**).
7. Aortic valve and coronary ostia reimplantation (**Fig.5** and **6**).
8. Distal anastomosis with an external teflon strip.


Figure 1


Figure 2

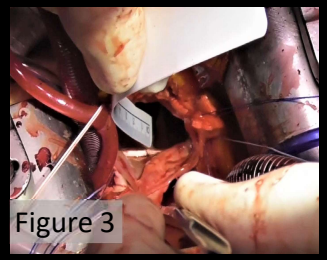
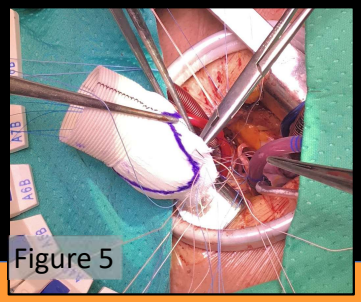

Figure 3


Figure 4


Figure 5

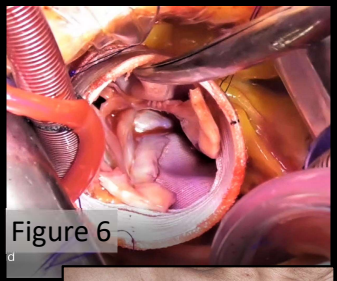

Figure 6


Figure 7

RESULTS.

From **01-10 to 10-12-2020**, **8** consecutive patients underwent aortic valve reimplantation procedure for aortic root aneurysm and/or annuloaortic ectasia, both without aortic valve insufficiency (3 pts.) and with different degrees of aortic regurgitation (mean degree 2+/4+ ±1.5).

Mean age: 55±5.8 years; **6 males/2 females**; **mean left-ventricle ejection fraction: 70±6.4%**; **mean preoperative NYHA: 1.9±1**.

All the procedures went successfully. The **mean CPB duration and cross-clamping time** were respectively **146±55.9 and 129.5±51.9 minutes**; the **mean ventilation time** was **4.8±3.7 hours**; the **mean ICU stay** was **2.3±1.2 days**. The **mean total in-hospital stay duration** was **8 days**. No patients died during the hospital course. None had aortic regurgitation more than mild at discharge. The only noteworthy complication was postoperative transitional atrial fibrillation in 2 patients.

CONCLUSION.

Our preliminary experience would suggest that the proven efficacy and safety of the aortic valve reimplantation (David) procedure, can also be guaranteed with a particularly minimally invasive approach such as RAT with totally central cannulation. These encouraging results need to be confirmed by a broader case series and follow-up data.