Video-assisted Thoracic Surgery for Congenital Heart Defects in Pediatric Patients

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BACKGROUND: Minimally invasive surgery (MIS) in congenital heart defects has recently gained popularity, providing better outcomes and lower perioperative morbidity compared with full sternotomy. The aim of this study is to describe our initial experience, unique in our country, in a program on video-assisted thoracic surgery (VATS) in paediatric patients plus peripheral cannulation..

METHODS: In 2000 we started the MIS program under the submammary access for closure of atrial septal defects; in 2009 we incorporated the axillary approach, and in 2013 the lower ministernotomy. Progressively we expanded to more complex cases and younger ages. In order to reduce surgical trauma, in 2015 we attended a animal model training for video-assisted repair in congenital heart defects and eventually started the paediatric VATS program (Figure 1).

RESULTS: As of December 2020, 361 cases under MIS had been performed, of which 18 patients belonged to the VATS program. 50% of these former cases were female. Median age was 13.1 years (range: 6.2-19.9 years). Median weight was 49 kg (range: 23-74 Kg). The cardiac conditions included secundum atrial septal defect (83.3%) (pericardial patch closure= 9 and direct suturing= 6), Ostium Primum Atrial Septal Defect (5.6%), Sinus Venosus Atrial Septal Defect (5.6%) and Mitral Valve Insufficiency (5.6%). Median cardiopulmonary bypass time was 124 min (range 90-325 min) and median aortic crossclamping time was 53 min (range 12-165 min). We also recently started with a combination of VATS + ventricular fibrillation (median = 29 min) in three cases. Periareolar approach was selected in our last three male patients. No patient required conversion to full sternotomy. However, we had to perform a submammary enlargement (8cms) in two cases. There were no perioperative complications, with the exception of two cases with compartment syndrome.

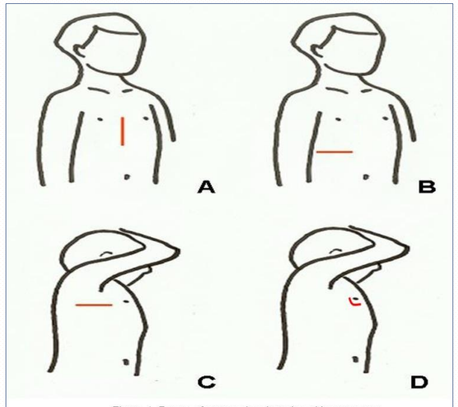
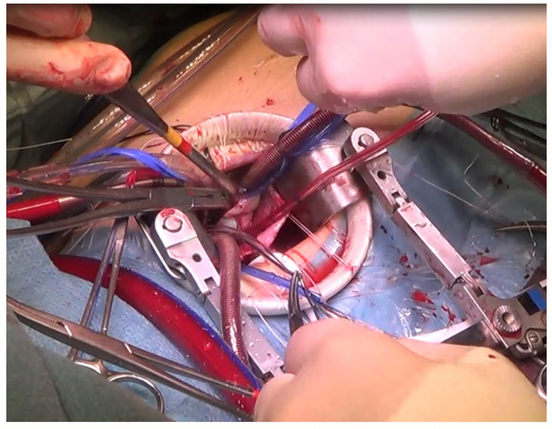


Figure 1. Range of approaches introduced in our center



CONCLUSIONS: Fixing congenital defects through mini-incisions with peripheral cannulation and video-assistance requires a learning curve. Therefore, a broad experience in mini-invasive access is recommended. The versatility of this approach, based on previous background, allows reconversion to a submammary or subaxillary access. Ventricular fibrillation is a good option to reduce ischemic times. The aesthetic results are excellent.