



## Up To 100% Mitral Valve Repair Through Minithoracotomy With A Simplified Technique

*Marco Diena, Gabriele Musica, Gheorghe Cerin, Mario Bobbio, Diana Botezatu, Gheorghe Cerin.*

*Cardioteam Foundation. San Gaudenzio Clinic, Novara, Italy.*

**BACKGROUND.** Despite clear data proving that mitral valve repair is the operation of choice in degenerative disease, the repair rate is still suboptimal for three major reasons: the difficulties to work through a small incision, the challenging bileaflet prolapse and the need of a perfect Echo assessment of each scallop. The purpose of this study was to evaluate if a simplified technique may allows an high repair rate through a small thoracotomy.

**METHODS.** From January 2011 to January 2018, 327 patients with a mitral prolapse underwent a mitral valve surgery via a right small thoracotomy in the third intercostal space. A simplified technique means a single endotracheal intubation, a single percutaneous venous cannula at the groin, a direct aortic cannulation with Custodiol cardioplegia and direct flexible aortic cross clamping. An intraoperative transesophageal echo was performed in all cases. A standard valve repair was accomplished.

**RESULTS.** Hospital mortality was 0.6 %. We could repair 100% of those valves, in three case we had to convert to sternotomy (1%) and in 3% of the cases a second pump run was necessary to adjust the repair. No patient was discharged with a mitral regurgitation more than mild. In all cases we had a good myocardial protection.

**CONCLUSIONS.** Mitral valve repair is feasible through a small thoracotomy with a repair rate up to 100% with low risk and low complication rate with this simplified technique that allows a very good surgical exposure, mandatory for complex repair together with a precise echo assessment. Minithoracotomy remain a demanding approach that need a proper training and tutoring.





## Minimally Invasive Mitral Valve Repair Through The Third Intercostal Space

**Marco Diena.**

*Cardioteam Foundation. San Gaudenzio Clinic, Novara, Italy.*

**OBJECTIVE:** Minimally invasive mitral valve surgery is usually performed via the fourth intercostal space and peripheral arterial cannulation. From this approach the visualization of the posterior aspect of the mitral valve and commissure is difficult and diaphragm may impair the direct vision. We present an alternative technique through the third intercostal space and direct aortic cannulation and cross clamping.

**METHODS:** Skin incision is performed below the right nipple and the minithoracotomy in the third intercostal space. Direct aortic cannulation and cross clamping through the surgical opening and cardioplegia in the aortic root. Than after positioning the small retractor the mitral repair is performed as usual.

**RESULTS:** In 335 patient scheduled for mimimally invasive mitral repair with this technique we had three conversion to sternotomy (1%) at the beginning of our experience. In 312 (93%) cases was possible to proceed with a direct aortic cannulation. In 99% of the patients we had a good or optimal visualisation of the whole mitral apparatus. All patients had a good myocardial protection.

**CONCLUSIONS:** Minimally invasive mitral valve repair via the third intercostal space with direct aortic cannulation has some advantages because reproduce the standard operation but less invasive. The surgical exposure may be better than through the fourth space particularly for the treatment of A3 and P3 prolaps or posterior commissure.





## Video-assisted Tricuspid Valve Repair Through Minithoracotomy With A Simplified Technique

*Marco Diena, Gheorghe Cerin, Luca Renzi, GianLuca Martinelli.  
Cardioteam Foundation. San Gaudenzio Clinic, Novara, Italy.*

**BACKGROUND.** Minimally invasive tricuspid valve repair is often cumbersome for its anatomical position and the difficulties to snare both Caval veins through the small incision. Here we describe how to approach the tricuspid valve via right minithoracotomy without snaring the caval veins with a single venous cannulation and video-endoscopic assistance.

**METHODS.** A single two stage venous cannulation is inserted percutaneously at the groin under echo guidance taking care to position its holes in superior and inferior caval veins. Extracorporeal circulation is started from the venous cannula and an aortic or femoral cannula. Concomitant to mitral surgery or as isolated procedure we stop the vacuum active drainage from the pump to avoid entering air into the circuit. Opening the right atrium as usual the venous cannula should lay down below the blood surface on the inferior aspect of the cavity. Pulling up the tricuspid valve by two stay sutures we proceed to repair the valve under direct or endoscopic vision.

**RESULTS.** On 334 consecutive patients with mitral regurgitation scheduled for a minithoracotomy, 56 (17%) had a severe tricuspid regurgitation or an enlarged anulus greater than 21mm indexed and were operated on the tricuspid valve with this technique. We had no mortality. In all cases we could repair the tricuspid valve in cross clamping with good results except one case discharged with a residual moderate insufficiency.

**CONCLUSIONS.** Tricuspid valve repair through minithoracotomy may be cumbersome if a very small incision is used at the time of caval snaring. This simplified technique avoiding to encircle both venae cavae and with video assistance allows an easier procedure and reduce the risk of injuries at this level. A strict cooperation between surgeon and perfusionist is mandatory to adjust the pump flow during the opening of the right atrium.

