Transapical NeoChord Implantation for Recurrent Mitral Regurgitation

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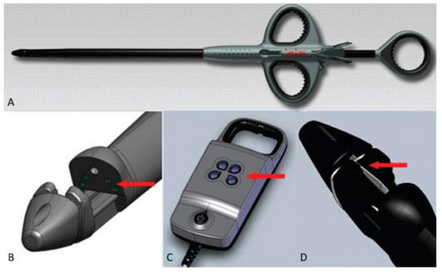
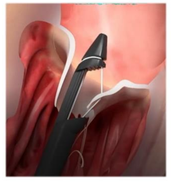
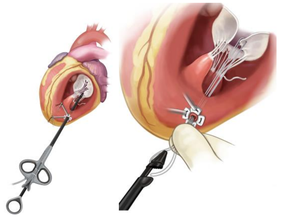
BACKGROUND

Mitral valve repair is the preferred treatment for degenerative mitral valve regurgitation (MR), with increased number of patients receiving repair. Repair failure is rare, reported around <2%, but often leads to mitral valve replacement.



The NeoChord DS1000 system can provide redo mitral valve repair off-pump, through a left mini-thoracotomy.





We describe outcomes for the first Canadian case series using this innovative device platform in patients with recurrent mitral regurgitation.

METHODS

- Prospective, single center series
- April 2022 and March 2025
- Patients were considered for conventional redo mitral valve surgery
- Patients with bileaflet prolapse, mitral annular calcification, and ischemic MR were excluded

RESULTS

Variable	Value (median (IQR) or n (%))
Age	72.4 (70.5-75)
Male Sex	5 (71)
EuroSCORE II (%)	2.9 (2.5-2.7)
Years since previous surgery	6 (4.5-8.5)
Cardiovascular Risk Factors	
Atrial Fibrillation	2 (29)
COPD	0 (0)
Coronary Artery Disease	2 (29)
Diabetes	0 (0)
Peripheral Vascular Disease	0 (0)
Renal Disease	0 (0)
Stroke	1 (17)
NYHA Class 3 or 4	1 (17)
Left Ventricular Ejection Fraction ≥55%	6 (86)
Tricuspid Regurgitation (≥moderate)	0 (0)

Median 3 sets neochords inserted

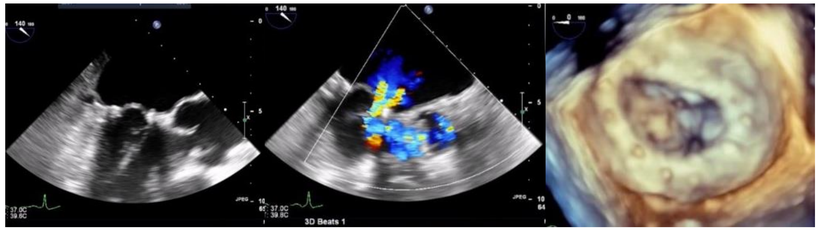
Median ICU length of stay of 24hrs

Median hospital length of stay of 4 days

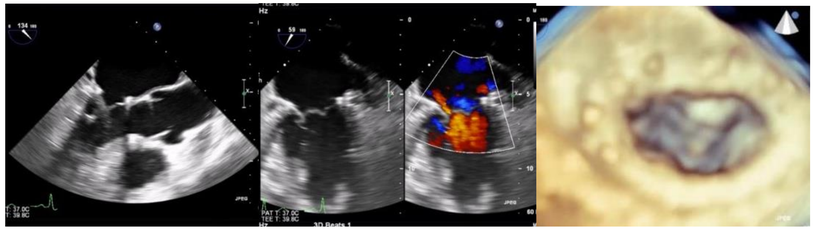
No device-related complications

Residual MR ≤mild at 1 year in 100% patients

Preoperative TEE:



Postoperative TEE:



CONCLUSIONS

- First reported Canadian experience with the NeoChord DS1000 system for off-pump, transapical, beating heart mitral valve repair, through a left mini-thoracotomy for recurrent MR
- Series is subset of international cohort
- Early surgical outcomes suggest this approach is feasible, safe, and effective in reducing MR
- Novel procedure has the advantage of offering a redo, minimally invasive, off-pump option for select patients with high redo surgical risk