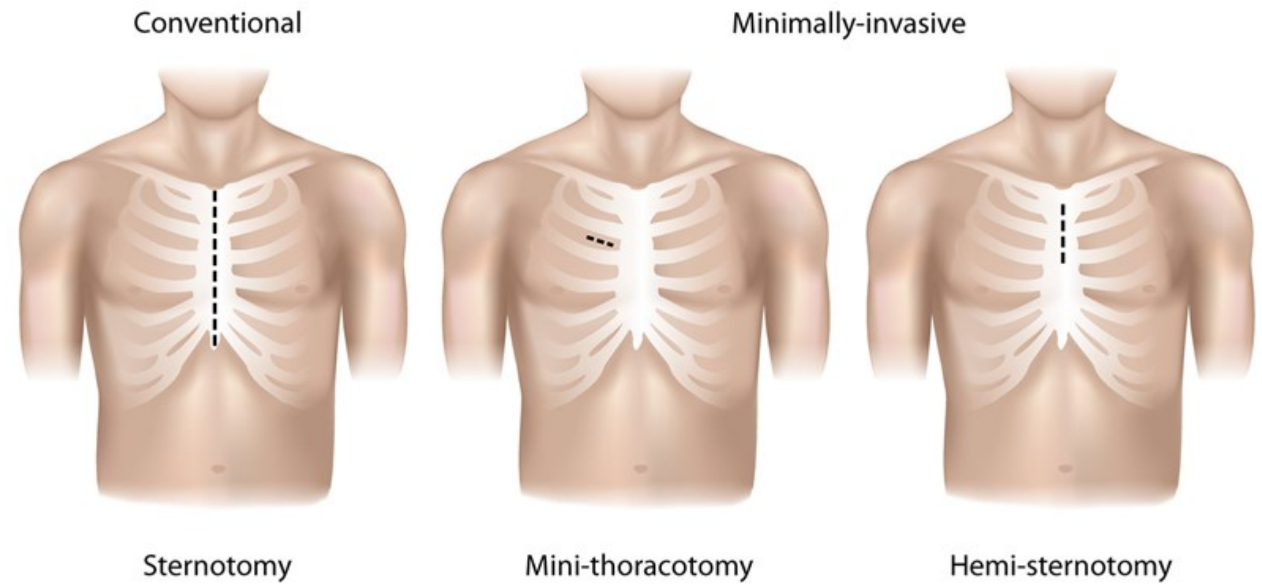
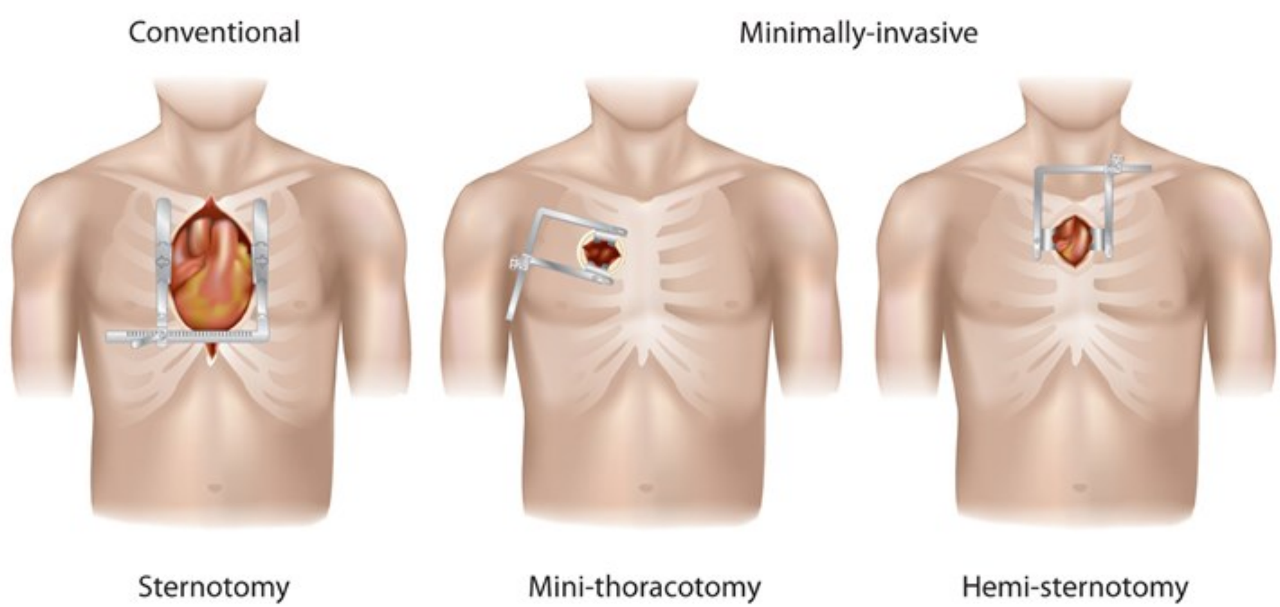
PHẪU THUẬT TIM ÍT XÂM LẤN

Ths. Vương Hải Hà _ C8 TM

1. SƠ LƯỢC VỀ PHẪU THUẬT TIM ÍT XÂM LẤN

2. NHỮNG TiẾN BỘ TRONG PHẪU THUẬT ÍT XÂM LẤN


Conventional
Minimally-invasive
Sternotomy
Mini-thoracotomy
Hemi-sternotomy


Conventional
Minimally-invasive
Sternotomy
Mini-thoracotomy
Hemi-sternotomy

LỊCH SỬ PHÁT TRIỂN

Table 1
Milestones in robotic cardiac surgery

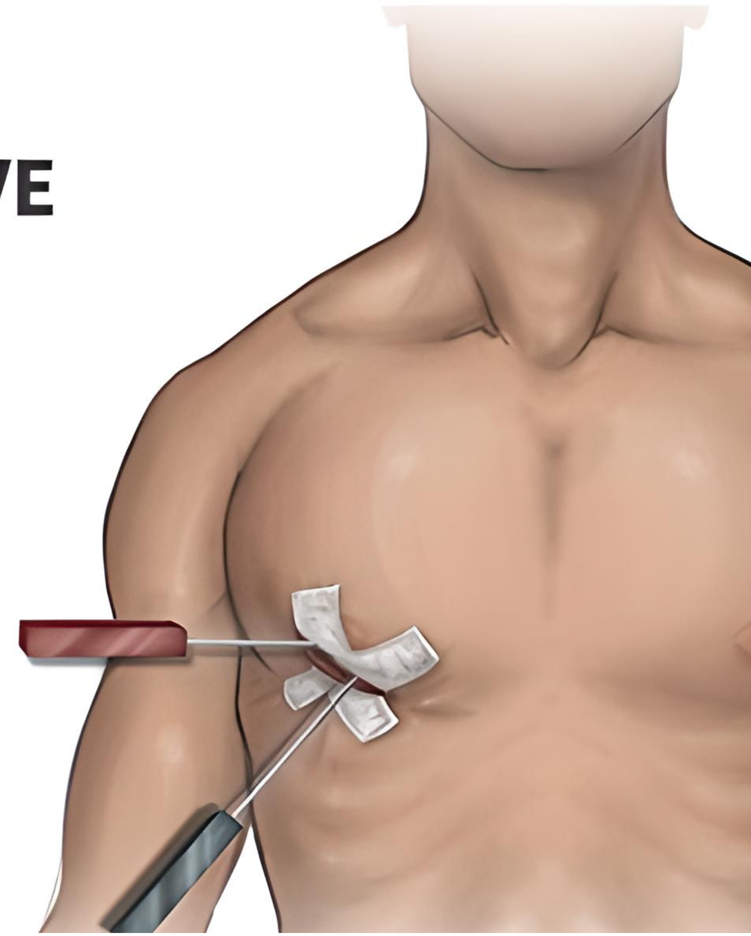
Surgery	Author, y
Robotic mitral valve repair	Carpentier et al, 1998
Robotic mammary harvesting	Mohr, 1998
Totally endoscopic coronary artery bypass with arrested heart	Loulmet et al, 1998
Totally endoscopic coronary artery bypass off pump	Falk, 2000
Use of BIMA in TECAB in arrested heart	Kappert, 2000
ASD closure	Torraca, 2000
Totally endoscopic mitral valve repair	Lange, 2002
LV lead implantation	DeRose, 2003
Use of BIMA in TECAB in beating heart	Farhat, 2004
Aortic valve replacement	Folliguet, 2004
Left atrial myxoma resection	Murphy et al, 2005
Aortic valve papillary fibroelastoma resection	Woo, 2005
Triple vessel TECAB	Bonatti & Srivastava, 2010
Combined mitral valve repair and CABG	Balkhy, 2013

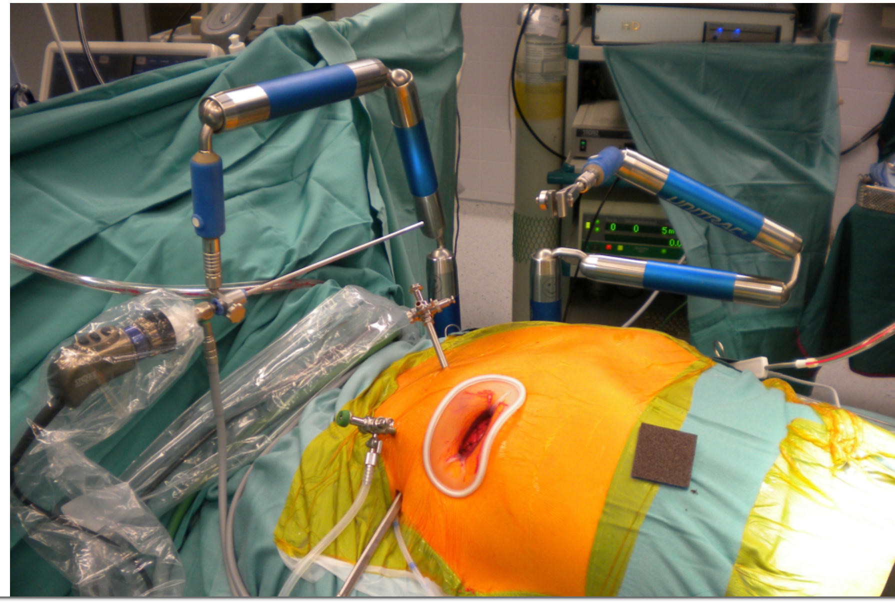
Abbreviation: BIMA, bilateral internal mammary artery.
Data from Canale LS, BJ. Current state of robotically assisted coronary artery bypass surgery, in Coronary Graft Failure: State of the Art. 2016. p. 65–74.

MINIMALLY INVASIVE CARDIAC SURGERY

Heart Surgery without Cutting any bone

- Less Pain
- Smaller Scars
- Early Recovery
- Smaller Incisions
- Reduced Infection Risk





Level 1

Direct vision: Limited (10–12 cm) incisions

Level 2

Direct vision/video assisted: Mini (4–6 cm) incisions

Level 3

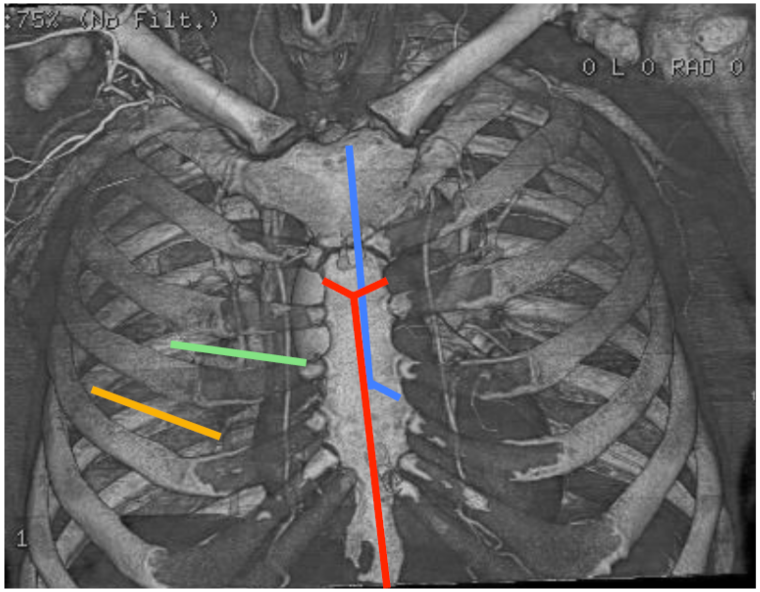
Video directed and robot assisted: Micro (1.2–4 cm) incisions

Level 4

Robotic (computer telemanipulation): Port (<1.2 cm) incisions

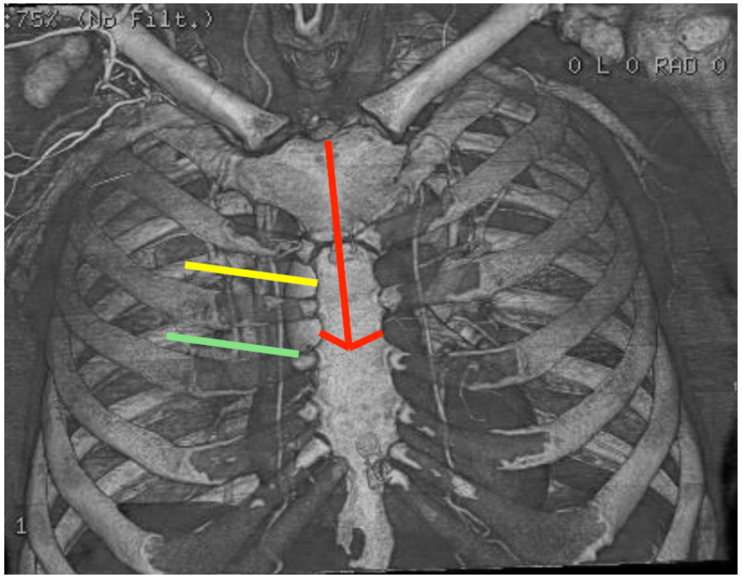
MICS access: **Mitral valve**

(tricuspid valve, atrial septum, aortic valve)

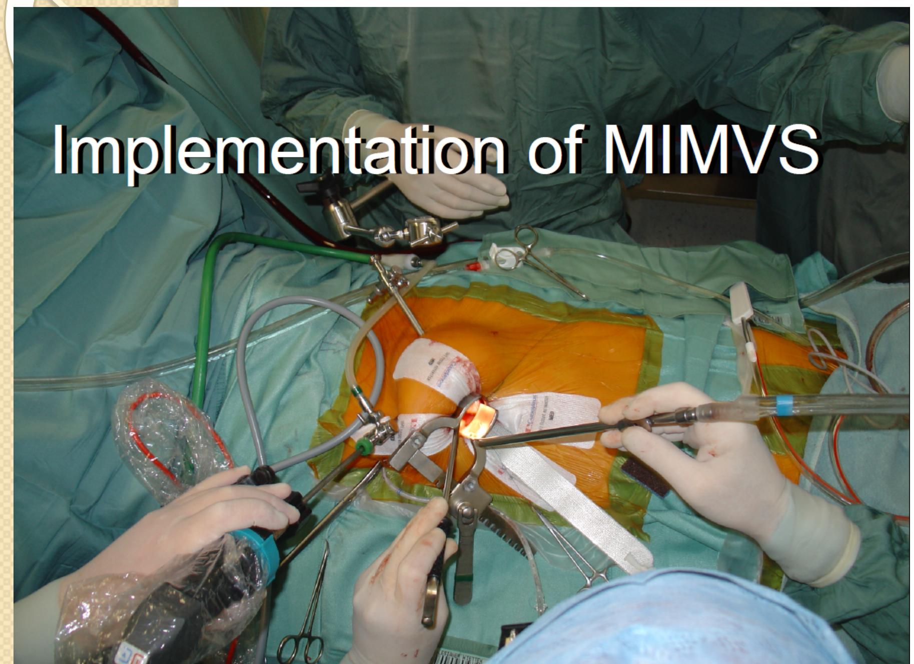


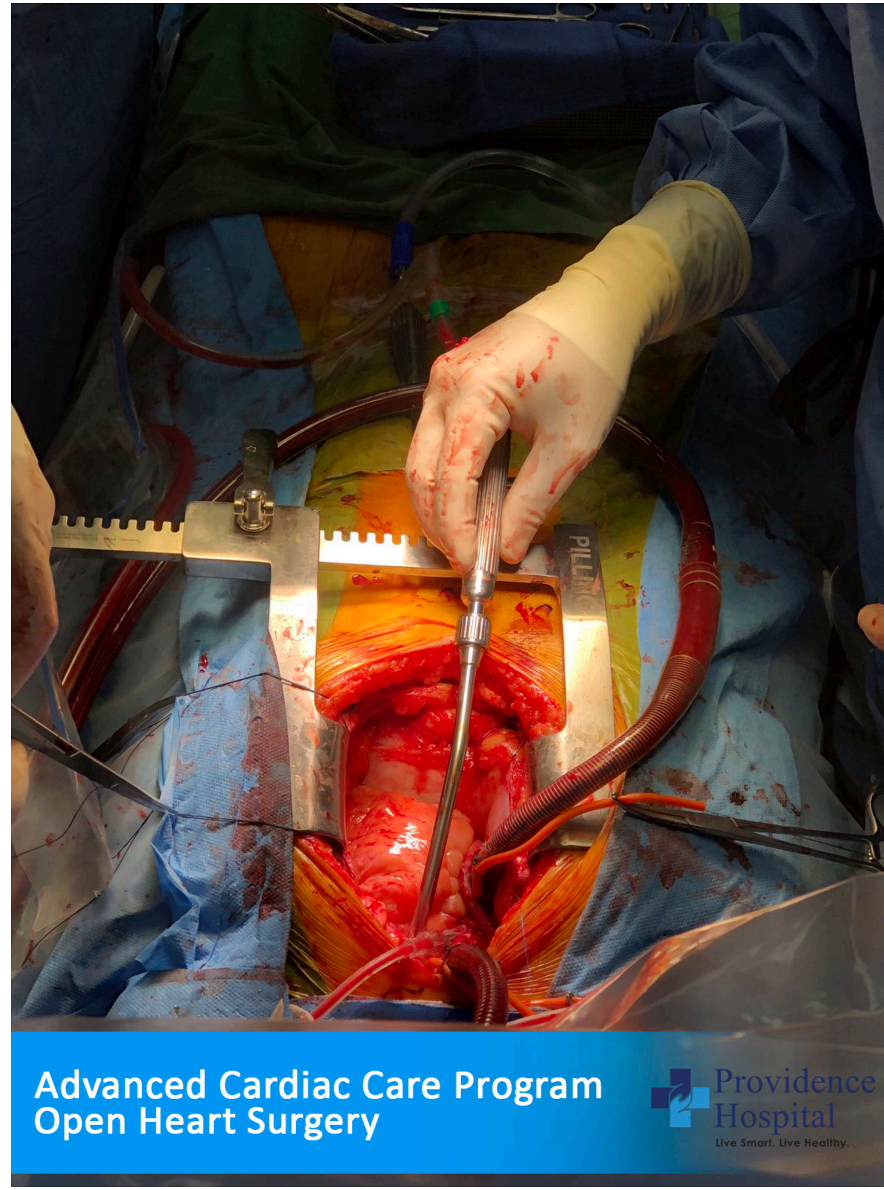
MICS access: **Aortic valve**

(ascending aorta, aortic root)



Hình ảnh các đường mổ MICS theo thời gian


Implementation of MIMVS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Providence
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Key points 1: advantages and disadvantages of the minimally invasive approach

Advantages

- Cosmetic results
- Specific advantages in redo mitral valve (MV) cases after sternotomy
- Improved visualisation and evaluation of the MV
- Decreased need for blood product transfusions
- Shorter ventilation time
- Shorter postoperative intensive care unit stay
- Decreased risk of postoperative atrial fibrillation
- Preservation of stability and continuity of the sternum

Disadvantages

- Need for video assistance
- Longer cross-clamp and cardiopulmonary bypass times
- Retrograde perfusion
- Increased risk of aortic dissections
- Increased risk of perioperative stroke
- Vascular complications from femoral artery cannulation
- Increased risk of phrenic nerve palsy
- Excludes patients after prior thoracotomy

GiẢM TRUYỀN MÁU SAU MỔ

ĐAU ÍT , THẨM MỸ

GiẢM THỜI GIAN NẰM ViỆN

GiẢM THỜI GIAN THỞ MÁY

Phẫu thuật tim loại nào có thể mổ được ít xâm lấn ???

- Thay, sửa van 2 lá
- Thay, sửa van ĐMC
- Thay sửa van 3 lá
- Phẫu thuật nhiều van tim
- CABG
- Phẫu thuật u tim bên phải, trái
- Tim bẩm sinh : TLN, TLT , CAVp, van ĐMP
- Phẫu thuật gốc ĐMC, ĐMC lên
- Kết hợp triệt đốt rung nhĩ (PT Maze)

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Minimally invasive heart surgery

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Many types of heart procedures may be conducted with minimally invasive heart surgery, including:

- Mitral valve repair or replacement
- Tricuspid valve repair or replacement
- Aortic valve replacement
- Atrial septal defect and patent foramen ovale closure
- Atrioventricular septal defect surgery
- Maze procedure for atrial fibrillation
- Coronary artery bypass surgery
- Saphenous vein harvest for coronary artery bypass surgery

Thay, sửa van 2 lá. Thay, sửa van 3 lá,
Thay van ĐMC
Vá TLN, CAVp
Maze
CABG, Lấy saphenous

Robot-assisted heart surgery team at Mayo Clinic

A Mayo Clinic surgeon and surgical team assist with robot-assisted heart surgery, while another surgeon sits at a remote console controlling the robotic arms.

Expertise and rankings

Mayo Clinic heart surgeons have extensive training and experience in performing minimally invasive heart surgery to treat a wide variety of heart conditions. Mayo Clinic heart surgeons perform more than 700 minimally invasive heart surgeries each year, including robot-assisted heart surgery and thoracoscopic surgery.

700 case ít xâm lấn / năm

ANNALS OF CARDIOTHORACIC SURGERY

Ann Cardiothorac Surg. 2017 Jan; 6(1): 1–8.
doi: 10.21037/acs.2017.01.02

PMCID: P
PMI

Fig. 1. The trocar settings of a patient. In this case, the working port was connected to the camera port incision.

The state of robotic cardiac surgery in Europe

Matteo Pettinari,[1] Emiliano Navarra,[2] Philippe Noirhomme,[2] and Herbert Gutermann[1]

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Abstract

Background

In the past two decades, the introduction of robotic technology has facilitated minimally invas surgery, allowing surgeons to operate endoscopically rather than through a median sternotomy. This approach has facilitated procedures for several structural heart conditions, including mitral valve repair, atrial septal defect closure and multivessel minimally invasive coronary artery bypass grafting. In this rapidly evolving field, we review the status of robotic cardiac surgery in Europe with a focus on mitral valve surgery and coronary revascularization.

Methods

S
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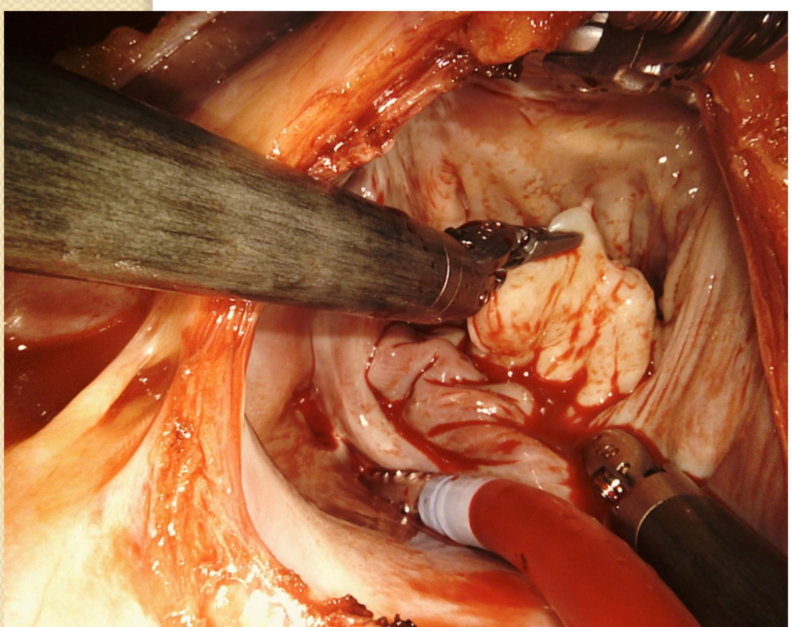
S
a

sternotomy. This approach has facilitated procedures for several structural heart conditions, including mitral valve repair, atrial septal defect closure and multivessel minimally invasive coronary artery bypass grafting.

MỘT SỐ MẶT BỆNH CỤ THỂ VỚI PHẪU THUẬT ÍT XÂM LẤN

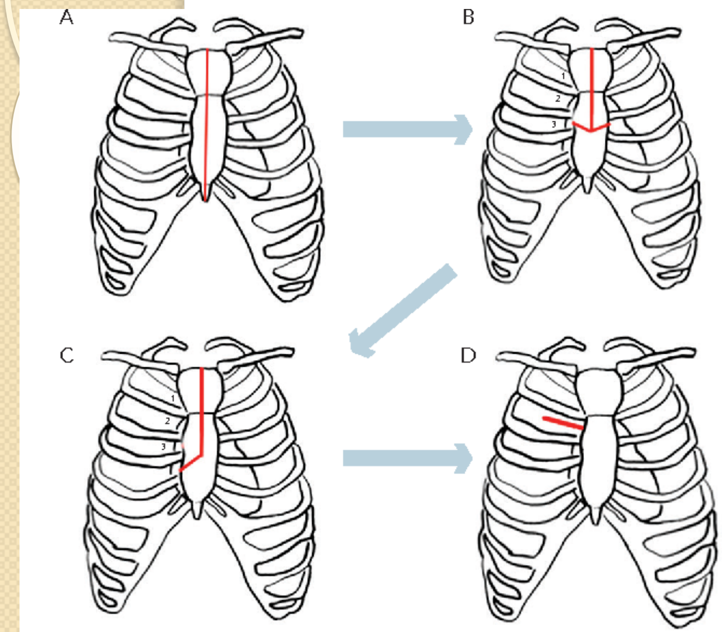
Phẫu thuật ít xâm lấn van 2 lá



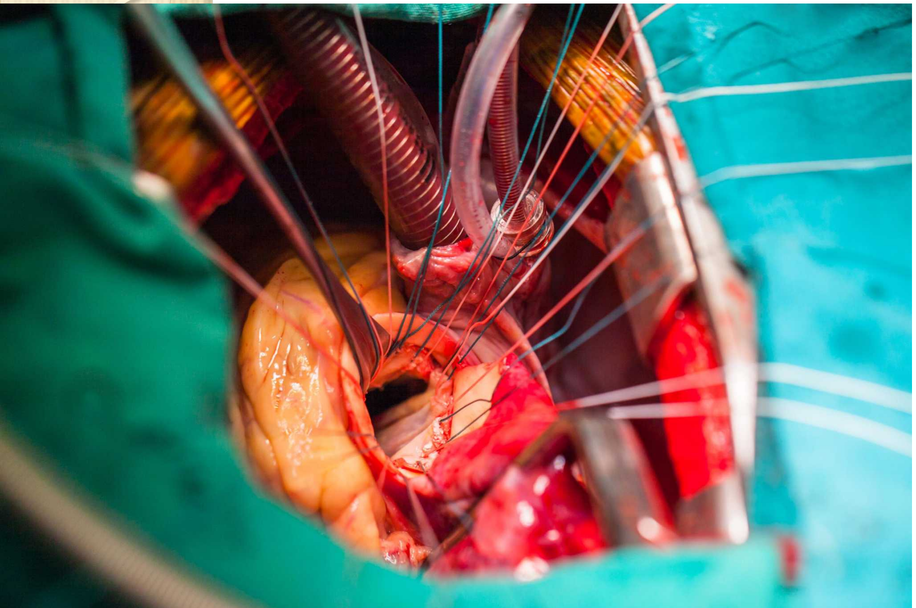
Hầu hết bệnh van 2 lá đều thực hiện được MICS trừ :

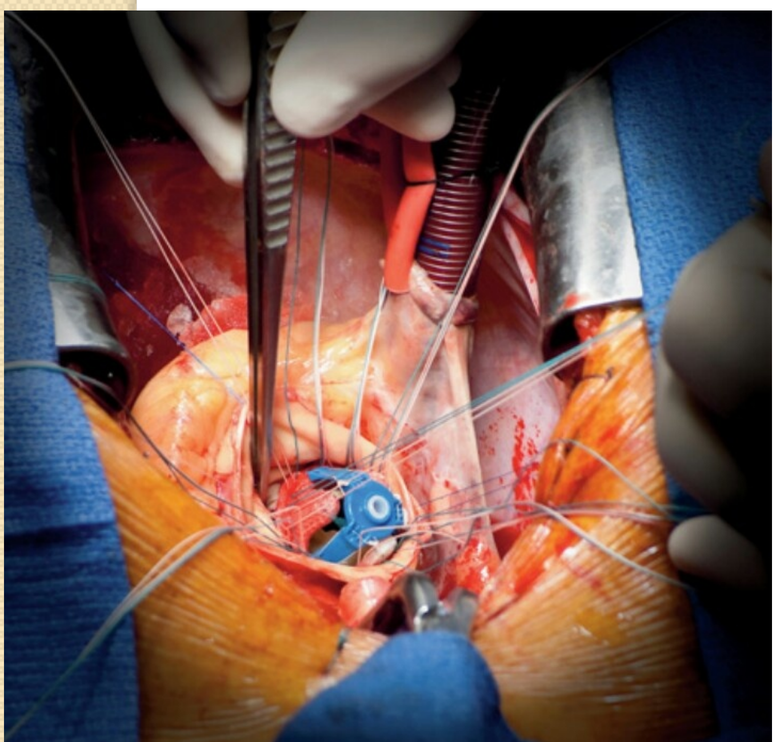
- Suy tim nặng , EF < 30%
- AL ĐMP cao > 80 mmHg
- Đã phẫu thuật tim trước đó
- Có BMV phối hợp nặng
- Bệnh mạch ngoại vi nặng

Phẫu thuật van ĐMC ít xâm lấn

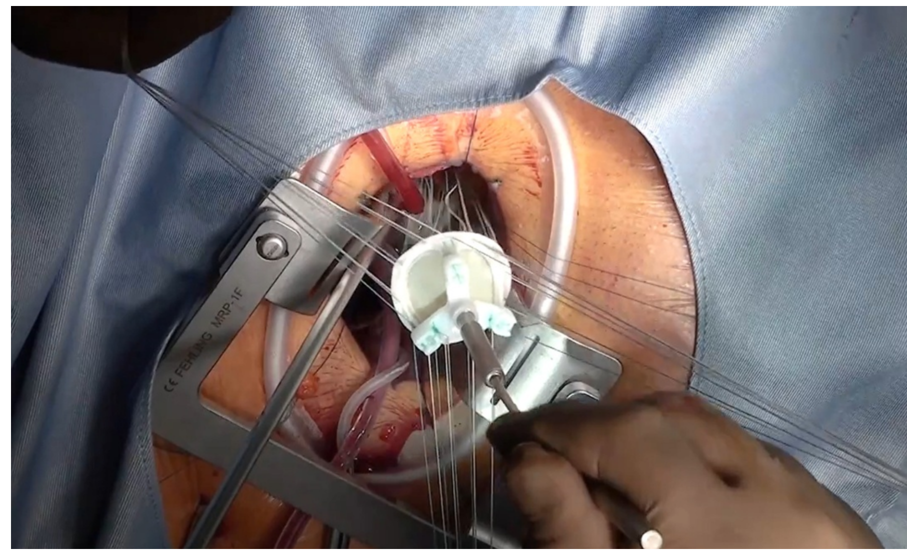


A: Full sternotomy incision; B: Hemi upper sternotomy with 'T' incision; C: Upper hemisternotomy with 'J' incision; D: Non-sternal incision – right anterior mini-thoracotomy





Mổ ít xâm lấn



Innovations
2020, Vol. 15(1) 88–92

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Early Clinical Experiences of Robotic Assisted Aortic Valve Replacement for Aortic Valve Stenosis with Sutureless Aortic Valve

Eiki Nagaoka[1], PhD, Jill Gelinas[1], MD, Marco Vola[2], MD, and Bob Kiaii[1], MD

Abstract
Robotic assisted aortic valve surgery is still challenging and debatable. We retrospectively reviewed our cases of robotic assisted aortic valve replacement utilizing sutureless aortic valve with following surgical technique: 3 ports, 1 for endoscope and 2 for the robotic arms were inserted in the right chest and da Vinci Si robotic system (Intuitive Surgical, Sunnyvale, CA, USA) was adapted to these ports. Cardiopulmonary bypass was initiated through peripheral cannulations. A vent cannula was placed through the right superior pulmonary vein and a cardioplegia cannula in the ascending aorta. After cardioplegic arrest following aortic cross-clamp, the aortic valve was exposed through a clam shell aortotomy. Valvectomy along with decalcification was performed. Next using 3 guiding

Robotic assisted aortic valve surgery is still challenging and debatable. We retrospectively reviewed our cases of robotic assisted aortic valve replacement utilizing sutureless aortic valve with following surgical technique: 3 ports, 1 for endoscope and 2 for the robotic arms were inserted in the right chest and da Vinci Si robotic system (Intuitive Surgical, Sunnyvale, CA, USA) was adapted to these ports. Cardiopulmonary bypass was initiated through peripheral cannulations. A vent cannula was placed through the right superior pulmonary vein and a cardioplegia cannula in the ascending aorta. After cardioplegic arrest following aortic cross-clamp, the

Robotic assisted mitral valve surgery has been validated and widely used.[1] Meanwhile, robotic assisted aortic valve surgery is still challenging and debatable for the point of methodology. Robotic surgery requires enough thoracic cavity space to handle robotic arms. Aortic valve is anatomically closer to the chest wall than mitral valve, therefore making aortic valve surgery more challenging. Another reason is that the present robotic instruments are not built for aortic valve surgery. Majority of aortic valve replacement (AVR) is for aortic stenosis. Robotic scissors and forceps are not strong enough to remove the heavily calcified aortic valve.

Case Series

We retrospectively collected data from 2 patients who underwent robotic assisted AVR in our institution between May and June 2018. Patient profiles are summarized in Table 1. Both of the patients had severely calcified aortic valve.

Patients who have suitable aortic anatomy could be a candidate for robotic AVR. To confirm the anatomy, preoperative computed tomography (CT) scan with contrast is mandatory. Aorta and peripheral vessels assessment is necessary. In general

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*Presented at the 2019 ISMICS Annual Scientific Meeting, May 30, 2019, at Marriott Marquis, New York, NY.

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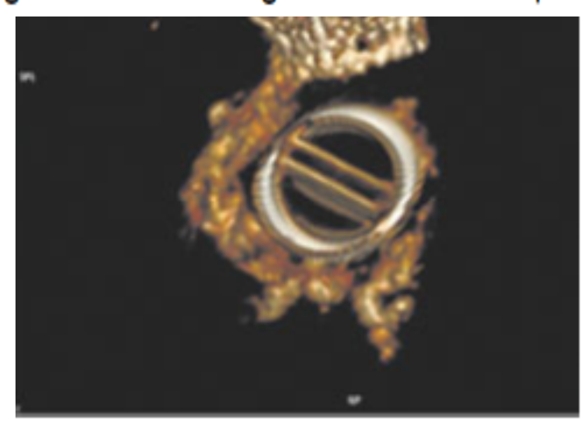

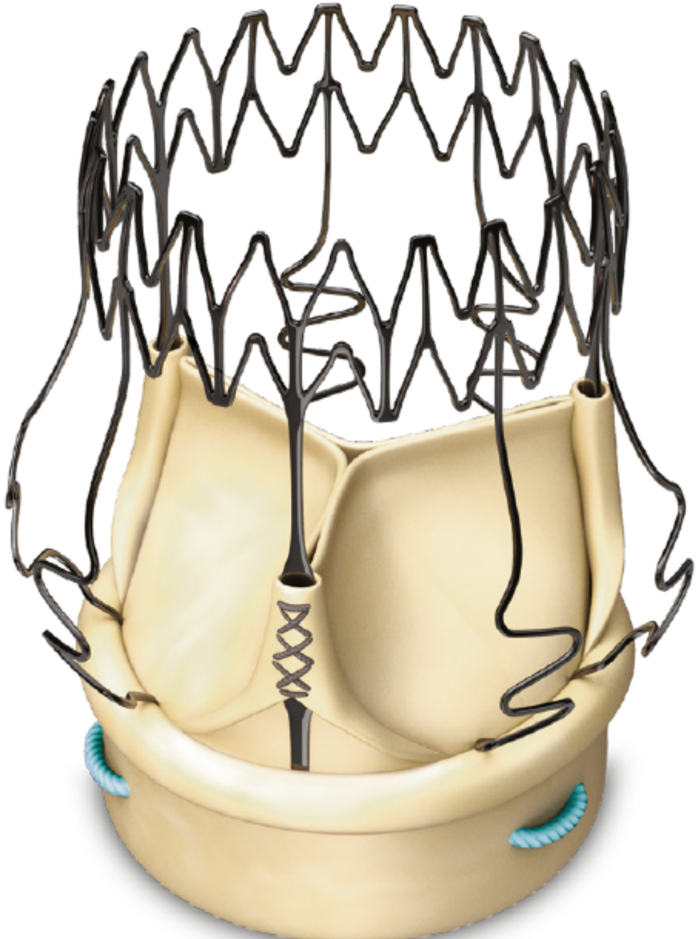
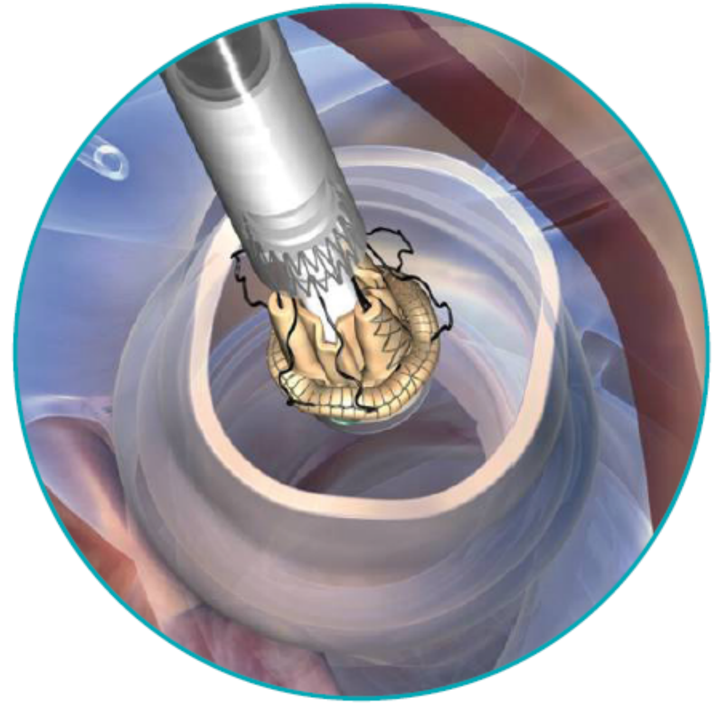

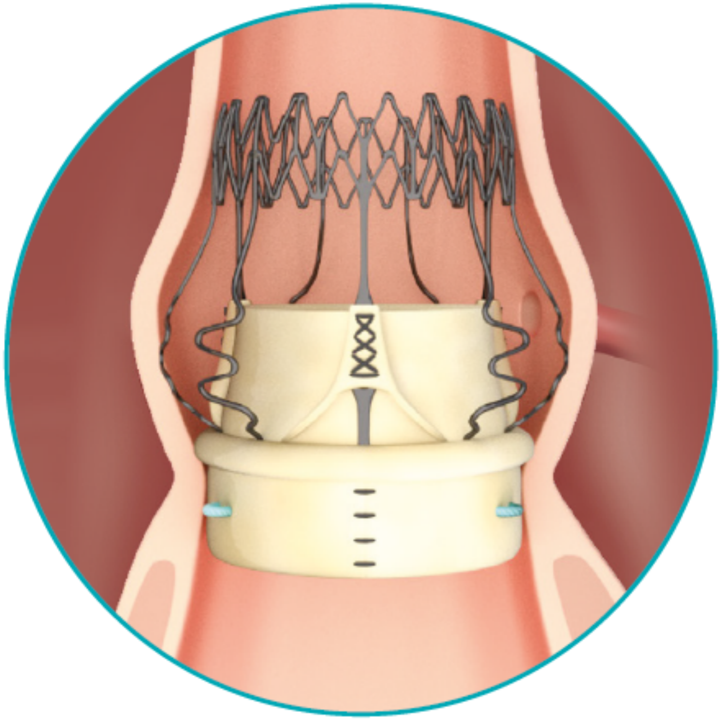

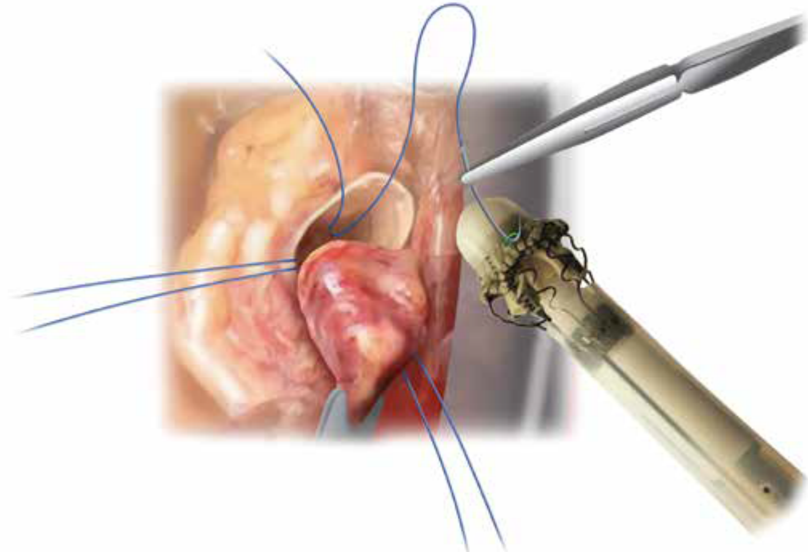

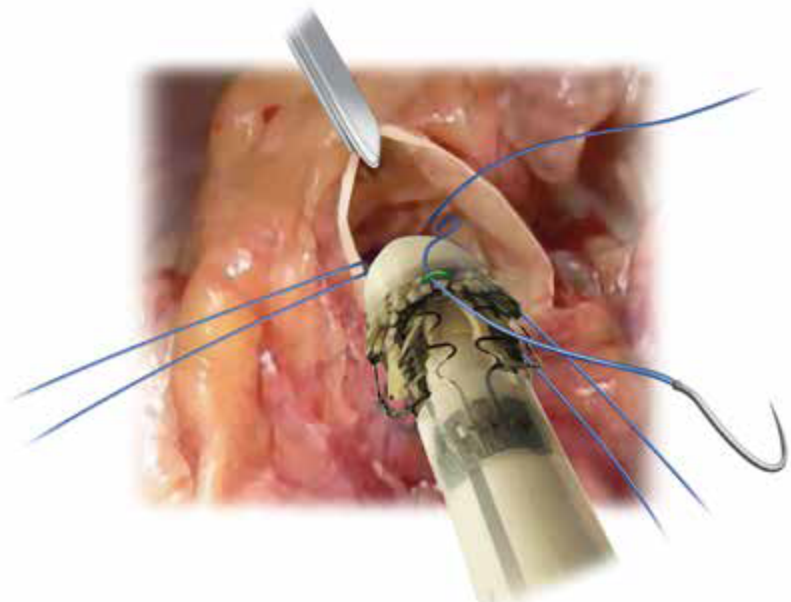

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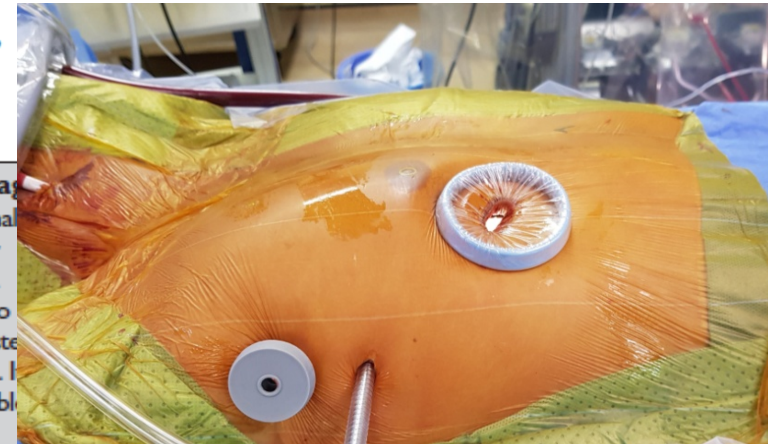
Endoscopic Tricuspid Valve Surgery is a Safe and Effective Option

Abdelrahman Abdelbar[1], FRCS C-Th, Gunaratnam Niranjan[1], FRCS C-Th, Charlene Tynnson[1], MRCS, Palanikumar Saravanan[2], FRCA, Andrew Knowles[2], FRCA, Grzegorz Laskawski[1,3], PhD, and Joseph Zacharias[1], FRCS C-Th, MD



Abstract

Objective: Isolated tricuspid surgery through median sternotomy can be associated with a high morbidity and mortality. Reports of minimally invasive isolated tricuspid valve operations are rare, but the outcomes are encouraging. We present our experience of endoscopic isolated tricuspid valve surgery. **Methods:** In our institution, 452 patients underwent endoscopic minimal access cardiac surgery between August 2008 and December 2018. A total of 90 patients underwent tricuspid valve surgery whether isolated or with other cardiac procedure. We further selected patients who had isolated tricuspid valve surgery (*n* = 24). Of these patients, 13 (54%) had more than one previous sternotomy. **Results:** Tricuspid repair was performed in 18 patients (75%) with the remaining 6 (25%) having bioprosthetic tricuspid replacement. Three (12.5%) were performed with a beating heart, the remaining with endoaortic clamping and

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Endoscopic minimal
access surgery for
tricuspid valve is a
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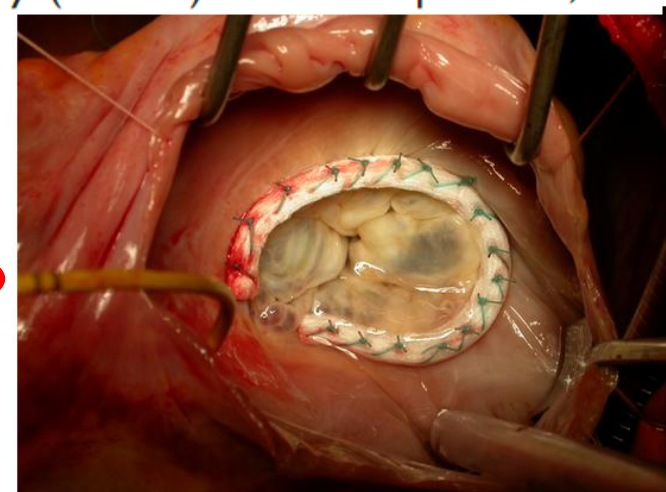
tricuspid valve surgery. **Methods:** In our institution, 452 patients underwent endoscopic minimal access cardiac surgery between August 2008 and December 2018. A total of 90 patients underwent tricuspid valve surgery whether isolated or with other cardiac procedure. We further selected patients who had isolated tricuspid valve surgery (*n* = 24). Of these patients, 13

procedure is particularly valuable in redo-surgery with low mortality and morbidity compared to historical sternotomy case series.

Keywords
endoscopic tricuspid surgery, tricuspid valve disease, endoscopic valvular surgery



Introduction

The prevalence of isolated tricuspid regurgitation being diagnosed in the population is increasing.[1] This is thought to be caused by the recent increase in implanting intracardiac devices and the prevalence of atrial fibrillation (AF).[2] Tricuspid regurgitation can be primarily caused by congenital abnormalities, radiation therapy, trauma, pacemaker leads, infective endocarditis, rheumatic fever, and myxomatous degeneration. Secondary tricuspid regurgitation is caused by annular dilatation secondary to conditions that causes right atrial and/or ventricle dilatation such as chronic AF.[3] There are also an increasing number of patients developing isolated tricuspid regurgitation poststernotomy cardiac surgery.[4]

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[3]Department of Cardiovascular Surgery, Medical University of Gdansk, Poland

*Presented at the 2019 ISMICS Annual Scientific Meeting in New York, NY from May 29 to June 1, 2019.

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Phẫu thuật nhiều van tim ít xâm lấn

Minimally invasive concomitant aortic and mitral valve surgery: the "Miami Method"

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Division of Cardiac Surgery, Mount Sinai Medical Center, Miami Beach, Florida, USA

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Road, Miami Beach, Florida 33140, USA. Email: j

Valve surgery via a median ste
various minimally invasive app
invasive valve surgery has gene
techniques in patients undergo
and mitral valve surgery, a mini
Method"), is the preferred me
enhanced recovery in our patie
our surgical approach, concepts

Keywords: Minimally invasive;

Submitted Jun 21, 2
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View this article at: http://dx.doi.org/10.3978/j.issn.2225-319X.2014.08.17

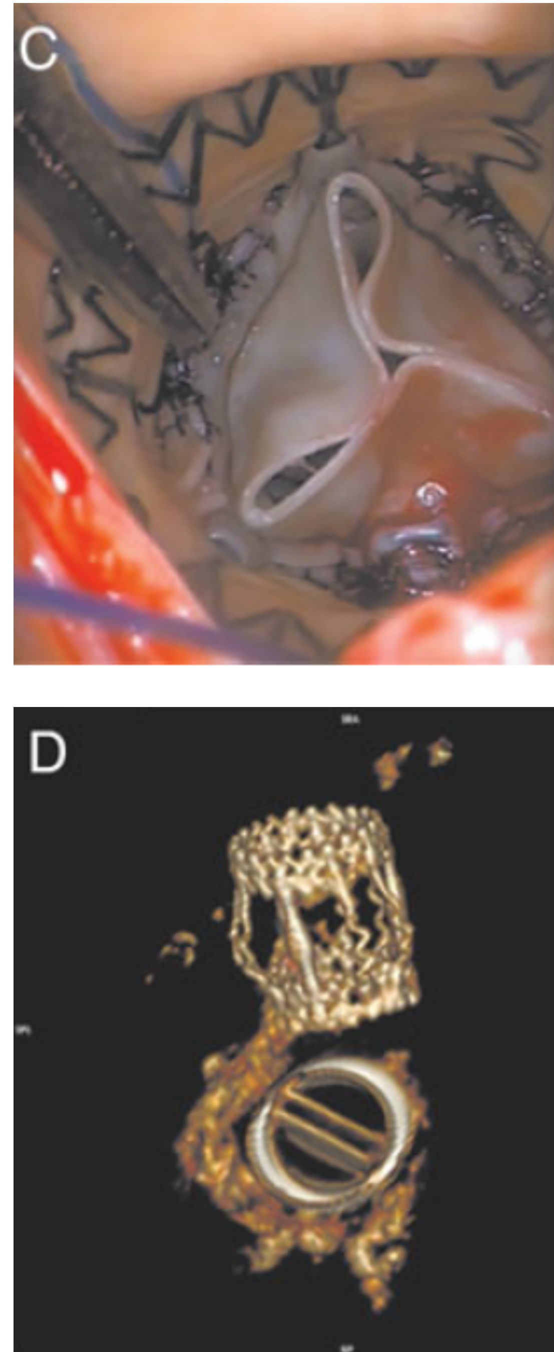
Clinical outcomes

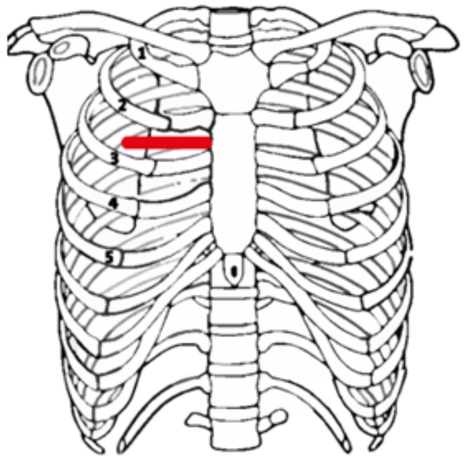
At our institution, from November 2008 to April 2014, we performed 2,344 minimally invasive valve surgeries, of which, 169 consisted of primary aortic valve replacement with concomitant mitral valve replacement or mitral valve repair. This is the largest series of concomitant minithoracotomy aortic and mitral valve operations that we are aware of. The most common valvular pathology consisted of aortic stenosis with calcific degeneration of the mitral valve (32.4%). This was followed by aortic stenosis

Table 1: Results (*N* = 69)

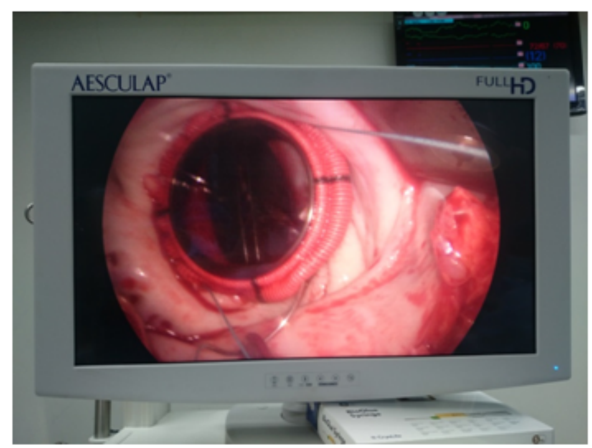
Mean age (years ± SD)	66 ± 12
Female, *n* (%)	47 (68.2)
Diabetes, *n* (%)	22 (32)
Extracardiac arteriopathy, *n* (%)	4 (5.8)
COPD, *n* (%)	6 (8.7)
Pulmonary artery pressure >50 mmHg, *n* (%)	25 (36.2)
Ejection fraction, % (mean ± SD)	57.1 ± 8.8
Log. EuroSCORE %, median (IQR)	8 (4–15)
Aortic stenosis/regurgitation, *n*/*n* (%/%)	50/19 (72/28)
Mitral stenosis/regurgitation, *n*/*n* (%/%)	17/52 (25/75)
AVR and MVR, *n* (%)	27 (40)
AVR and mitral valve repair, *n* (%)	35 (50)
Mitral and aortic valve repair, *n* (%)	7 (10)
Combined procedures	
Tricuspid valve annuloplasty, *n* (%)	12 (17.4)
Atrial fibrillation surgery, *n* (%)	8 (11.6)
Myectomy, *n* (%)	2 (2.9)
Conversion to sternotomy, *n* (%)	1 (1.5)
Cardiopulmonary bypass time, min (mean ± SD)	135 ± 41
Cross-clamp time, min (mean ± SD)	95 ± 32
Mortality, *n* (%)	0 (0)
Stroke, *n* (%)	2 (2.9)
Pacemaker implantation, *n* (%)	3 (4.3)
Intensive care unit stay, days (median, IQR)	1 (1–2)
Hospital stay, days (median, IQR)	6 (5–8)

SD: standard deviation; COPD: chronic obstructive pulmonary disease; IQR: interquartile range; AVR: aortic valve replacement; MVR: mitral valve replacement.



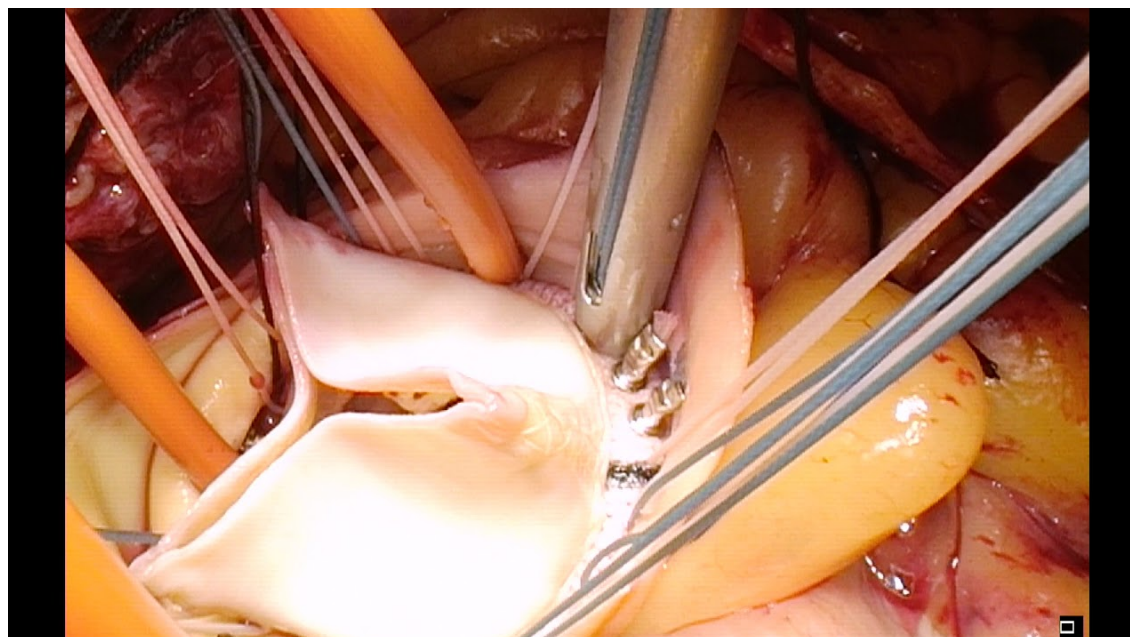


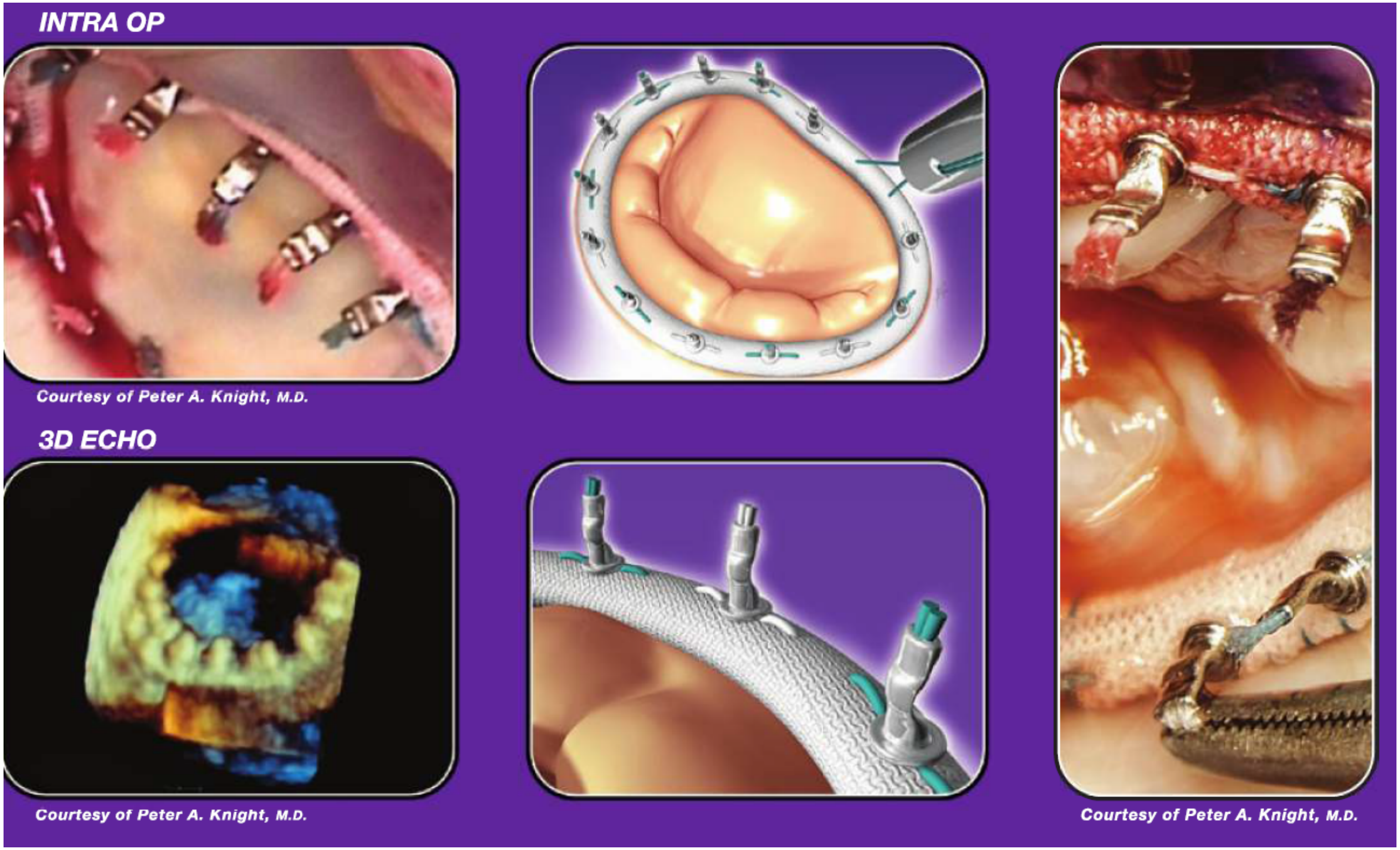
Hình 3 : vị trí rạch vào khoang liên sườn 2



Buộc chỉ tự động mang tới sự tối ưu cho mổ ít xâm lấn


COR-KNOT



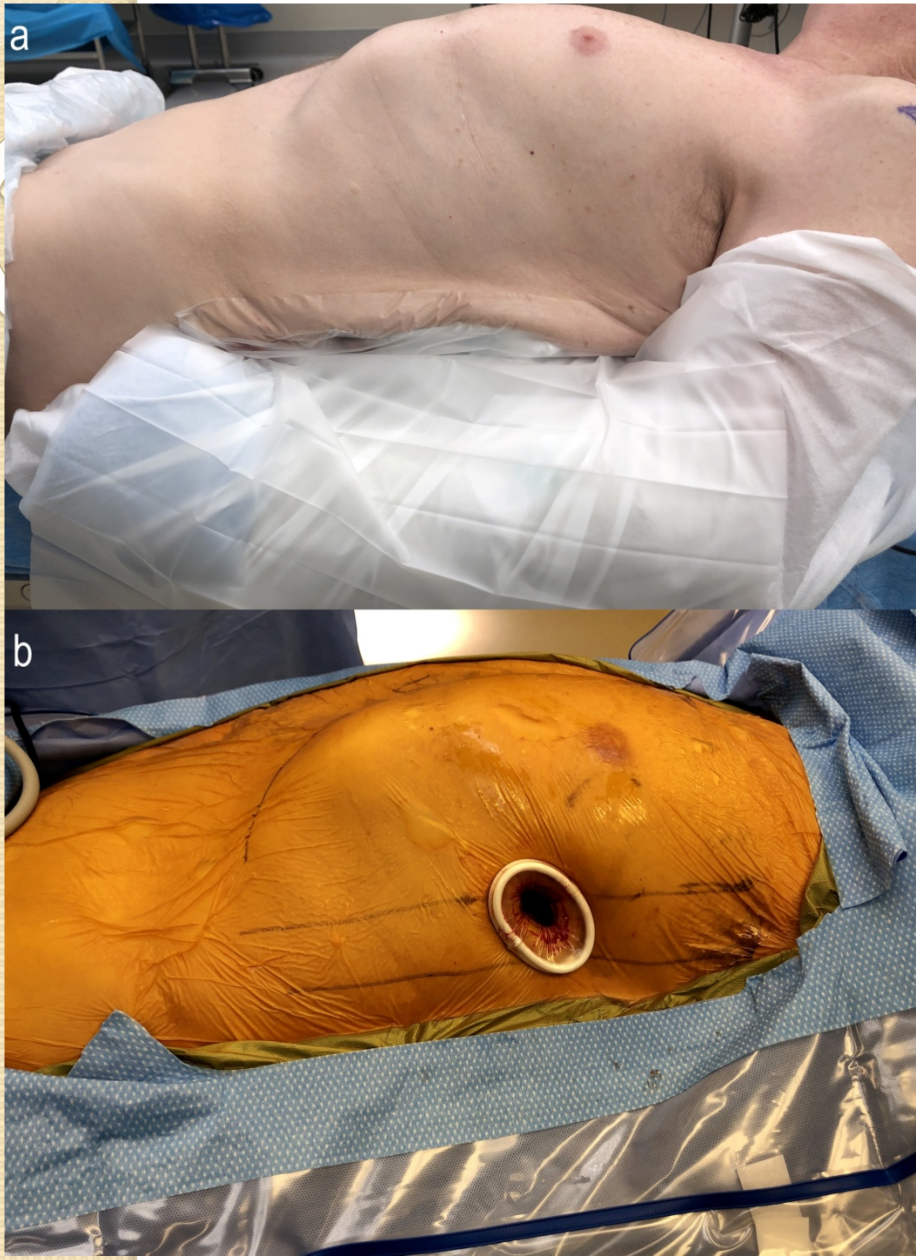

INTRA OP
Courtesy of Peter A. Knight, M.D.
3D ECHO
Courtesy of Peter A. Knight, M.D.
Courtesy of Peter A. Knight, M.D.

Dụng cụ thắt và cắt chỉ khâu tự động
dùng trong phẫu thuật nội soi
Đường kính 5mm, chiều dài làm việc 31cm

Dụng cụ thắt và cắt chỉ khâu tự động
dùng trong phẫu thuật mổ mở
Đường kính 4mm, chiều dài làm việc 17cm

Dụng cụ nạp chốt titan

THẮT TiỂU NHĨ TRÁI



Three-Dimensional Imaging Improves Accuracy in Clip Sizing During Thoracoscopic Left Atrial Appendage Exclusion

Syed M. Ali Hassan[1], BSc, Byron H. Gottschalk[2], MD, Andres En
Gianluigi Bisleri[1], MD, FRCSC

Abstract

The AtriClip is an epicardially applied occlusion device for the left atrial appendage. Ac
sizing and placement of the device is essential to its success. We describe the use of 3-dimen
computed tomography imaging to aid in accurate sizing of the AtriClip device during tho
scopic surgical ablation. This technique reduces the risk of improper sizing of the devic
thus mitigates the risk of malpositioning and potential damage or compression to surrou
structures such as the circumflex coronary artery.

Keywords

left atrial appendage, exclusion, thoracoscopy

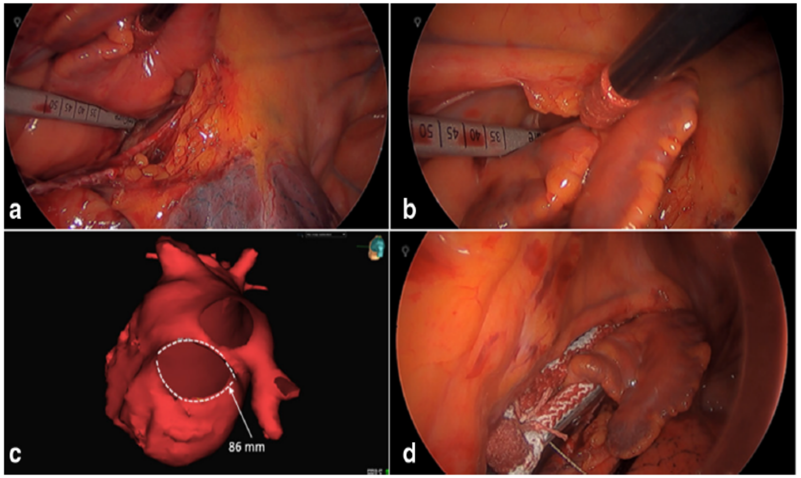


Fig. 1. (**a**) and (**b**) The base of the LAA is identified and measured on both sides using the selection guide, indicating a size of 50 mm. (**c**) Three-dimensional–computed tomographic imaging mapping the base of the LAA. The perimeter of the LAA base is measured as 86 mm and divided in half, indicating a size of 43 mm. (**d**) Based on the selection guide measurement a 50 mm device is deployed, and it is oversized. LAA, left atrial appendage.

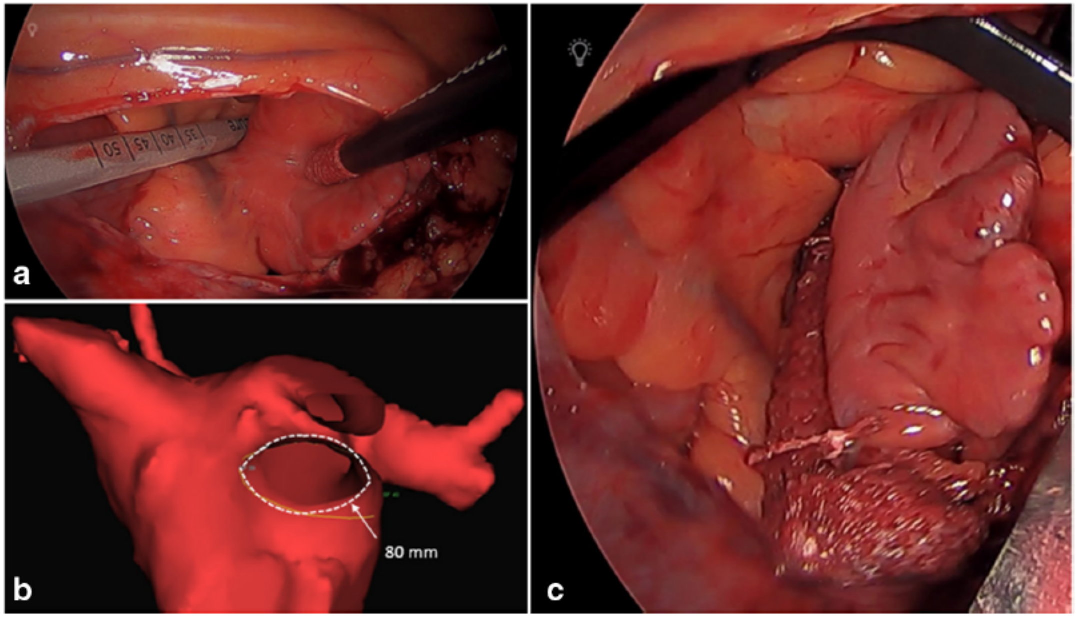


Fig. 2. (**a**) The selection guide is unable to provide a precise measurement of the base of the LAA. (**b**) Three-dimensional CT imaging

Left Anterior Mini-Incision for Pulmonary Valve Replacement Following Tetralogy of Fallot Repair

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Joseph R. Nellis[1,2], MD, MBA, Andrew M. Vekstein[1,2,3], MD, James M. Meza[1,2
Nicholas D. Andersen[2,3,4], MD, John C. Haney[3], MD, and Joseph W. Turek[2,3,4], I

Abstract

Pulmonary insufficiency is a known complication following Tetralogy of Fallot repair. With over 90% of patients now surviving to adulthood, surgeons are once again faced with the question of when, and more importantly, how to reintervene. We developed a novel approach to pulmo-

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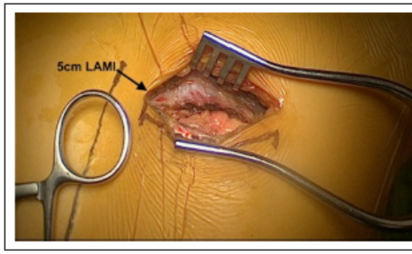

Fig. 1. Left anterior mini-incision (LAMI) relative to midline. The incision is 5 cm in length and positioned over the third rib with the ability to complete the dissection inferiorly into the second or third intercostal space in order to provide the best exposure.

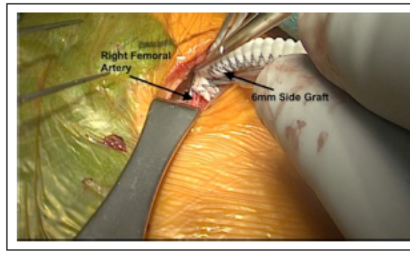

Fig. 2. Arterial cannulation via right femoral artery. Through a 3-mm cutdown incision in either groin, a 6-mm dacron graft is sewn end-to-side to the femoral artery for arterial cannulation.

than 30 kg, at which point cannulation of femoral vessels is considered feasible. All patients undergo preoperative echocardiogram with bubble study to confirm the absence of septal

made in the RVOT extending up the MPA to the level of the bifurcation (Fig. 3). Coordination with the perfusion team as well as suction catheters in the RVOT and bilateral branch PAs are crucial for achieving a near-bloodless field during beating-heart operation.

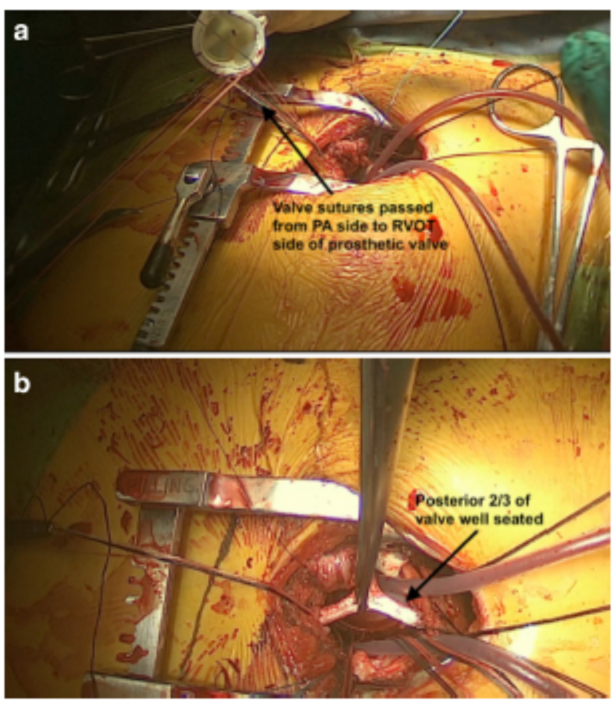

Fig. 4. Parachuting and seating the pulmonary valve. a) Double-arm nonabsorbable braided valve suture is placed through the annulus posteriorly such that pledgets are on the main pulmonary artery (PA) side of the annulus and the free arms arm brought through the sewing cuff to exit on the right ventricular outflow tract (RVOT) side of the valve. b) The posterior two-thirds of the valve sewing ring is being secured.

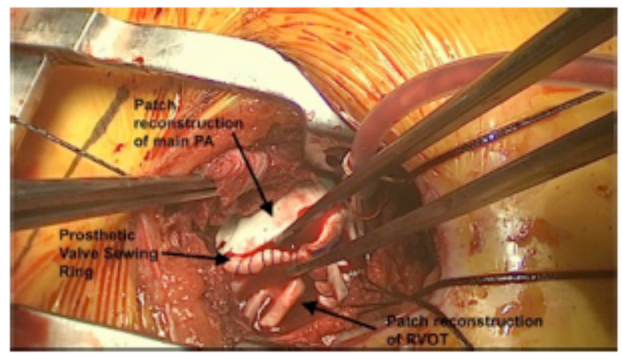

Fig. 5. Completed pulmonary valve replacement (PVR) with patch augmentation prior to closure through a left anterior mini-incision (LAMI). View of completed PVR and right ventricular outflow tract (RVOT) patch augmentation. The pickups are grasping the sewing ring of the bioprosthetic valve, the anterior one-third of which has been secured to the trans-annular Gore-Tex patch with looped running nonabsorbable monofilament suture.

along the sides of the MPA down each side of the RVOT to the nadir of the elliptical patch (Fig. 5).

With the repair complete, the patient is weaned off cardiopulmonary bypass and the adequacy of the repair evaluated by transesophageal echocardiography. If the repair is sound without significant pulmonary insufficiency or paravalvular leak, the femoral venous cannula is removed. For the femoral arterial side graft, we favor removing the graft and repairing the vessel rather than clipping/oversewing as there is concern for narrowing the vessel with this approach. Typically, a patch repair of the arteriot-

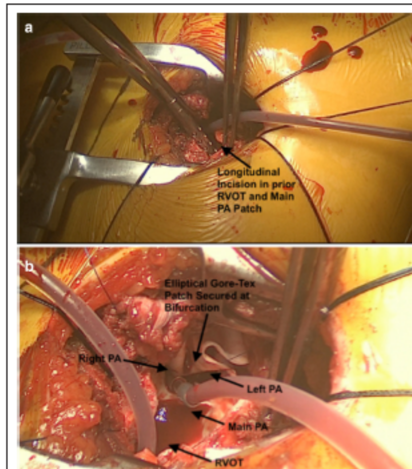

Fig. 3. Exposure of right ventricular outflow tract (RVOT) and pulmonary artery (PA) via left anterior mini-incision (LAMI). a) View of mini-rib retractor, pericardial retention sutures to provide appropriate exposure. b) View of drop suction placement inferiorly into the RVOT and superiorly into the main PA. The apex of the patch has been secured to bifurcation.

Initial Experience with Non-Sternotomy Minimally Invasive Pulmonary Embolectomy with Thoracoscopic Assistance

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John M. Fallon[1], MD, Jason W. Greenberg[2], BS, Luvika Gupta[3], BS, and Omar
MD, PhD

Abstract

The endpoint in emergent management of acute massive pulmonary embolism (PE) has traditionally bee through standard median sternotomy. This approach is limited in both exposure and concomitant functio ated with sternotomy. Herein we describe a novel minimally invasive, thoracoscopically assisted approach lectomy. This utilizes a small 5-cm left parasternal thoracotomy and femoral cardiopulmonary bypass to cond assisted surgical pulmonary embolectomy. This novel minimally invasive approach has been developed an in 3 patients with massive PE at our institution. The assistance of the thoracoscope allowed for complete extraction of the main and segmental pulmonary arteries bilaterally. The use of a non-sternotomy approach and pulmonary recovery times and decreased length of stay. These initial data suggest that non-sternotor

Fig. 2. Close-up view of closed thoracotomy incision in the left third

Fig. 3. Overall perspective of the location of a healed thoracotomy incision as seen in the office in follow-up.

Fig. 5. Thrombus extraction using ringed forceps.

Fig. 7. Follow-up computed tomographic scan of "Patient C" showing no residual clot.

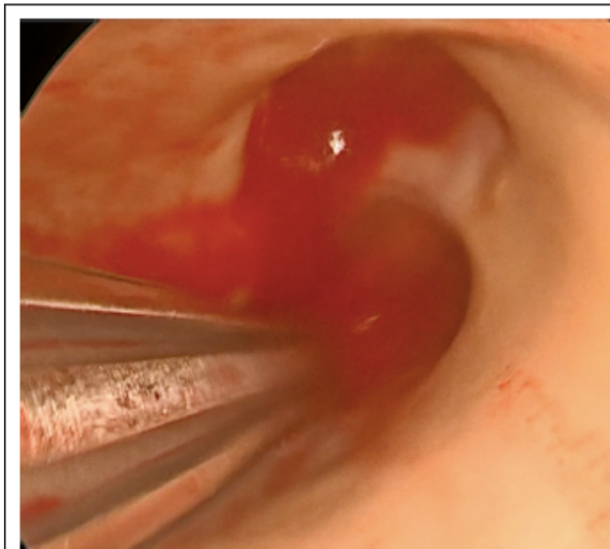

Fig. 6. View from the 30° 5-mm thoracoscopic camera within the pulmonary artery.

tion without hemodynamic compromise and small PE is often asymptomatic, with preserved RV function.[1–4] Mortality rates differ significantly by class of PE with approximately 20% mortality for massive PE and less than 1% for small PE.[1]

Treatment of massive PE involves more invasive modalities such as thrombolysis, catheter-directed embolectomy, and surgical embolectomy.[2,4,5] Surgical embolectomy has traditionally

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2020, Vol. 15(2) 95–99

Minimally Invasive Cardiac Surgical Procedures in Children

Pedro J. del Nido[1], MD

Introduction

Efforts to reduce the trauma and discomfort associated with thoracic and cardiac procedures in children have a long and complex history. While much of the early focus has been on smaller incisions, efforts to reduce the adverse effects of cardiopulmonary bypass, reduce pain associated with the incisions, and more recently, ameliorate the impact of the whole in-hospital experience have evolved as new technology and techniques have been developed. Many of the concepts follow the principles used in adult minimally invasive procedures, however, modified for the available instruments for pediatric surgery and take advantage of the more flexible chest wall structures in young children. In this summary we will review the approaches that have been described and comment on the evidence that they achieve the desired goal of minimizing the

in children describe procedures treating abnormalities of the great vessels, such as ligation patent ductus arteriosus,[1] or division of vascular rings,[2] and airway procedures, there are a few reports applying endoscopic techniques in intracardiac repairs.[3,4] In general, the results reported with extracardiac

comfort in manipulation of delicate tissue approach that is afforded by open chest conventional cardiac procedures. While most of the published reports utilizing totally endoscopic tools in children describe procedures treating abnormalities of the great vessels, such as ligation patent ductus arteriosus,[1] or division of vascular rings,[2] and airway procedures, there are a few reports applying endoscopic techniques in intracardiac repairs.[3,4] In general, the results reported with extracardiac endoscopic procedures have been excellent with few if any complications reported in large series. Nevertheless, there has not been widespread application of these techniques in large part due to the learning curve associated with the thoracoscopic procedures in children, along with the need for specialized instruments required and the greater length of time these procedures take compared to open thoracotomy. Also, it must be acknowledged that transcatheter interventions to treat the same

extracardiac anomalies currently pr tive for many of these patients. This based procedures are safer, as repo transcatheter procedures typically rates, and no side-by-side comparis ducted or will likely be conducte catheter-based procedures. Serious described with both endoscopic and however, these are rare.

Robot-Assisted Procedures

Reports of application of robotic surgery of the heart and great vessels in children have been described in small series with mostly extracardiac applications.

nerve in ligation of patent ductus. Similarly, for more complex cases of division of vascular ring, the superior field of view was from the robotic endoscopic camera along with greater dexterity of the robotic instruments compared to standard thoracoscopic rigid instruments.[5,6] These were brief reports, however, with few cases, and the children were 8 to 10 years of age. Thus, reports of robotic procedures have been mostly confined

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Email: pedro.delnido@cardio.chboston.org

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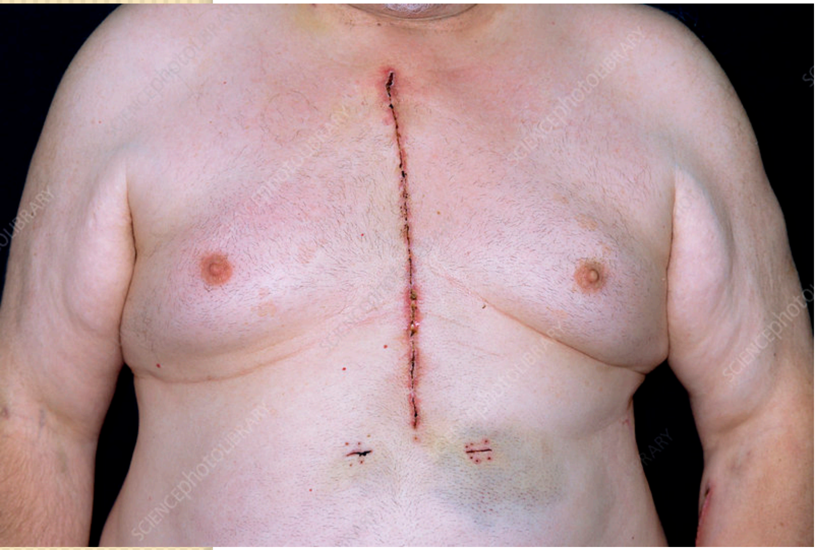

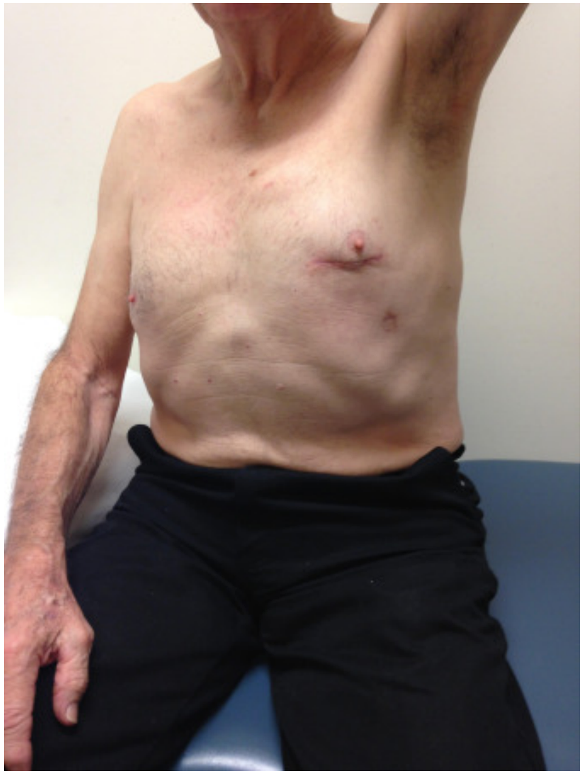

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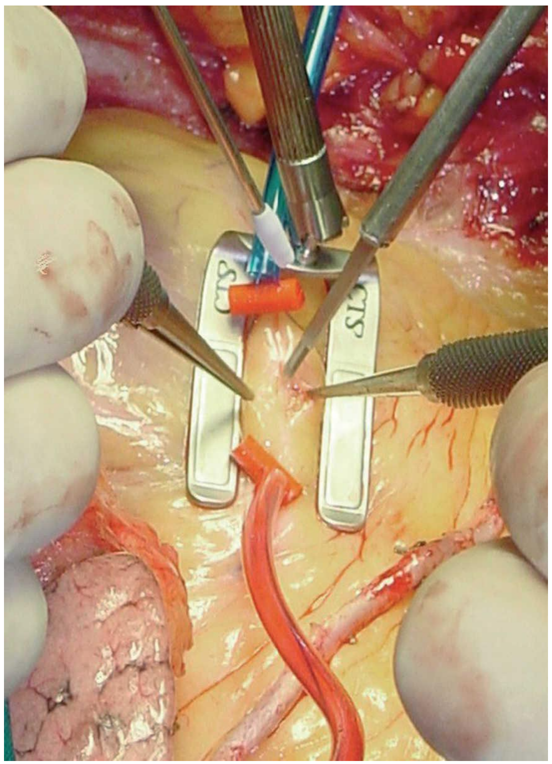

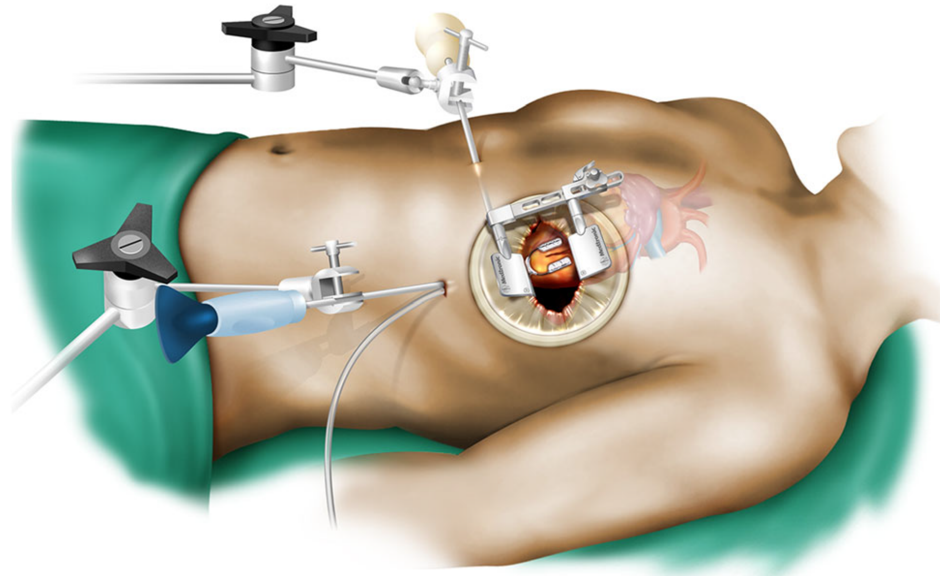

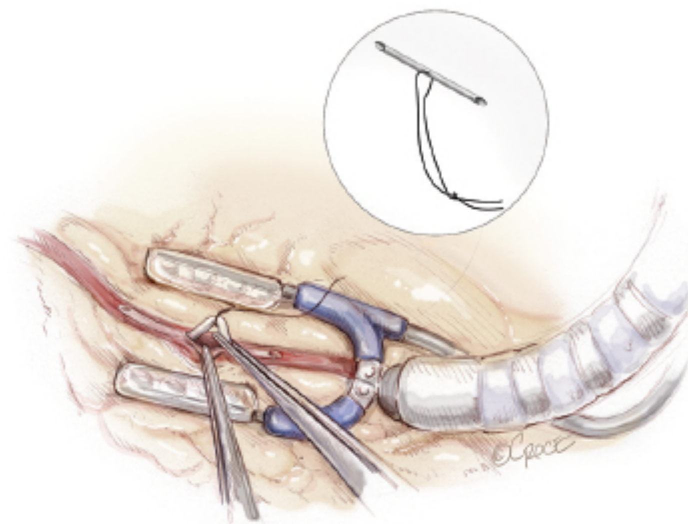

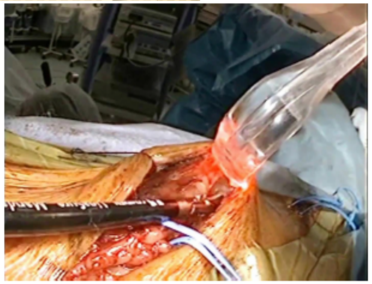

Fig. 1. Subcutaneous tissues are dissected then a tunnel is created by sharp and blunt dissection.

proximal first technique, and branch bleeding was assessed by clipping the distal end of the SV for leakage before coronary anastomosis. The intima, tunica media, adventitia, and vasa vasorum appeared normal based on the histological image of the SV segment (Fig. 5).

Discussion

Here, we present our technique for minimally invasive NT-SV harvest. Some cardiac centers prefer the endoscopic or bridge incision technique for SV graft harvesting,[4,5] which has a low rate of harvest site complications but has a lower patency rate.[6] The poor graft quality is attributed to damage to the intima, tunica media, and adventitia during the procedure.[5] To prevent structural injury from bridge incisions, we have developed a novel harvesting technique using the Ligasure device and Koplight (Fig. 6).

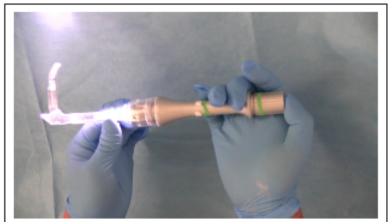

Fig. 2. A cordless retractor with built-in LED light source

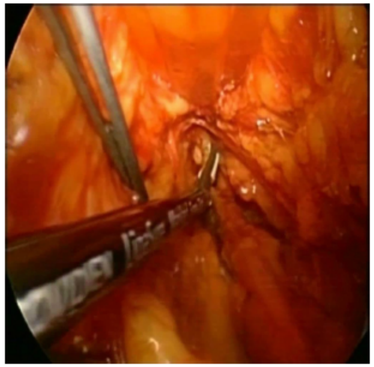

Fig. 3. Koplight used to brighten and enhance the visualization of the surgical field for better exposure.

Fig. 4. Postoperative view of the leg incisions

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Use of the No-Touch Saphenous Vein Harvesting Technique via Small Incisions

Ichiro Hayashi[1], MD, Ichiro Kashima[2], MD, and Eiji Yoshikawa[1], MD

Abstract

There are substantial data in support of improved patency using the no-touch (NT) saphenous vein (SV) harvesting technique. However, wound complications correlated with such are more significant than those associated with the skeletonized technique. To solve this, we introduced the use of the electrothermal bipolar vessel sealing device via small incisions. In this study, a cordless retractor with a built-in LED light source was utilized. The NT-SV graft was harvested with a pedicle of surrounding tissue approximately 5 mm in size and attached to the main trunk. The intima, tunica media, adventitia, and vasa vasorum appeared normal by histological analysis. Our technique combines the potential advantages of a minimally invasive endoscope approach using bipolar electrothermy and the improved patency of a NT-SV.

Keywords

minimally invasive saphenous vein harvesting, no-touch saphenous vein graft, bridge incision

Central Message

We introduced the use of the electrothermal bipolar vessel sealing device via small incisions. This no-touch saphenous vein graft harvesting technique could be beneficial in preventing postoperative complications and sealing certain vessels.

Introduction

The use of the no-touch (NT) saphenous vein (SV) harvesting technique is associated with improved graft patency.[1] However, wound complications correlated with this technique are more significant than those associated with a skeletonized technique.[2] Most complications are caused by thermal injury resulting from the use of heat-generating monopolar electrocautery and damage in the superficial large lymph vessels anatomically accompanying the SV during sharp dissection with the Metzenbaum scissors.[3] To solve this, we introduced the use of the electrothermal bipolar vessel sealing device (Ligasure, Medtronic, Minneapolis, MN, United States) because it can ...read, cause limited ...od and lymphatic

...g was performed to ...-SV graft could be ...legs. The skin was ...tely 3 to 5 cm long ...ubcutaneous tissues ...n and a tunnel was ... with a pedicle of

surrounding tissue of 5 mm attached to the main trunk. A cordless retractor with built-in LED light source (Koplight, YASUI Corp., Kadogawa, Miyazaki) was inserted through small incisions made at the upper thigh, knee, and ankle levels (Fig. 2) to brighten and enhance surgical field visualization (Fig. 3). After the vein was dissected as far as possible in both directions, a new small incision was made (Online Supplemental Video 1). Before removing the SV graft, it was marked with a surgical marking pen to prevent twisting. The vein was cannulated and lightly flushed with heparinized saline. Forceful overdetention was prevented as it damages the endothelium. After inserting the suction drain, the skin was closed (Fig. 4). The vein graft was anastomosed to the ascending aorta off pump with a

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[2]Department of Cardiothoracic Surgery, Misyuku Hospital, Tokyo, Japan

*Presented at the e-Poster competition during the 2019 Annual Scientific Meeting of the International Society for Minimally Invasive Cardiothoracic Surgery, New York, NY, USA from May 29, 2019 to June 1, 2019.

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Original Article

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2020, Vol. 15(1) 43–50

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Endoscopic Radial Artery Harvesting During Anesthesia Line Placement Reduces the Time and Cost of Multivessel Coronary Artery Bypass Grafting

Hanjay Wang[1], MD, Mary S. Bilbao[1], PA-C, Shari L. Miller[1], PA-C, Christian T. O'Donnell[1], MD, and Jack H. Boyd[1], MD


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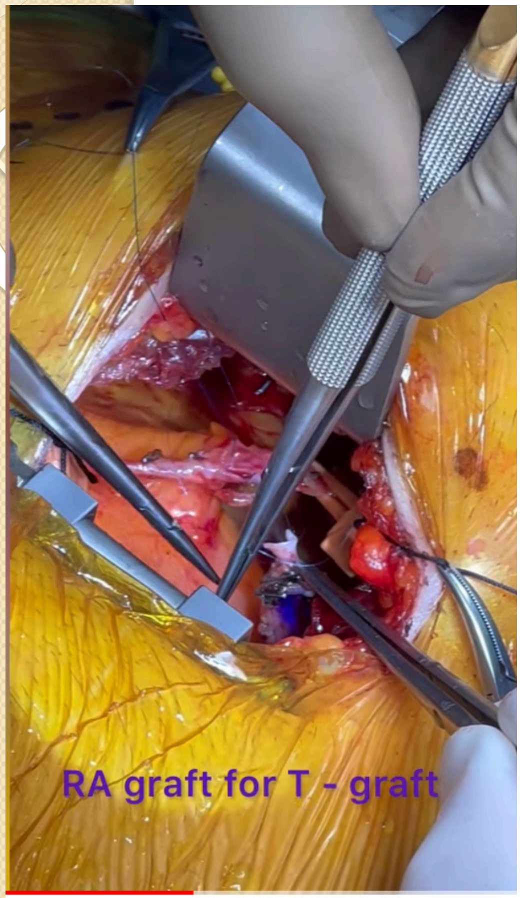
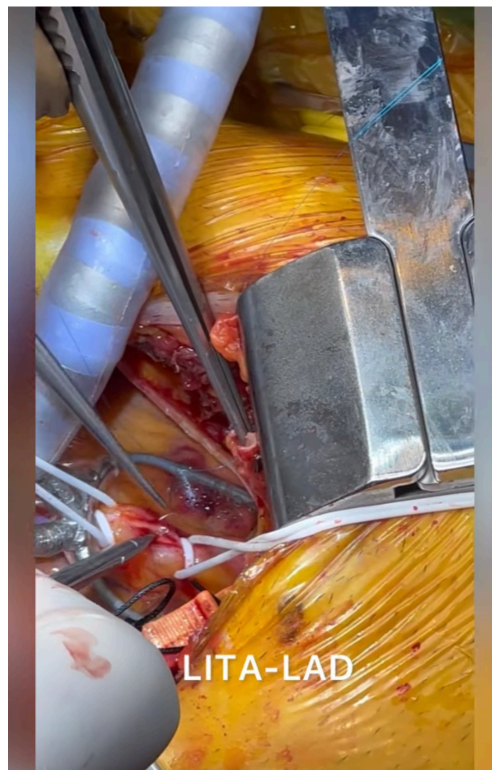
OVH


RA graft for T - graft


LITA-LAD


Endoscopic radial artery harvesting

Lợi ích của MICS- CABG

- Tránh phải chạy máy tim phổi nhân tạo
- Giảm truyền máu sau mổ
- Giảm được các biến chứng sau mổ
- Giảm được thời gian nằm viện
- Thẩm mỹ

Lựa chọn BN MICS - CABG

- Những BN cao tuổi nhiều bệnh phối hợp sẽ được hưởng lợi với phương pháp này
- Một số BN không phù hợp :

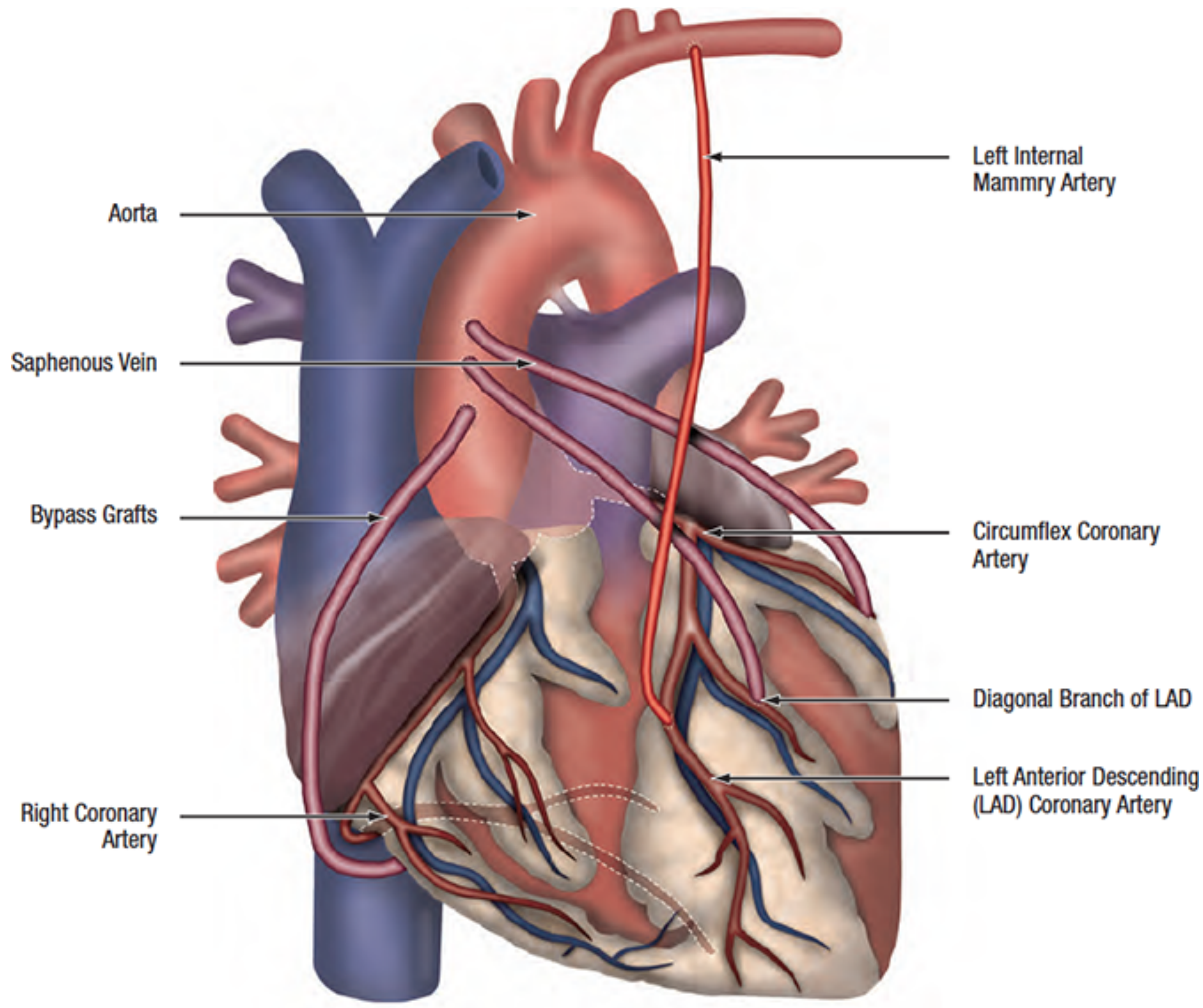
+ phẫu thuật cấp cứu

+ bệnh mạch ngoại vi nặng

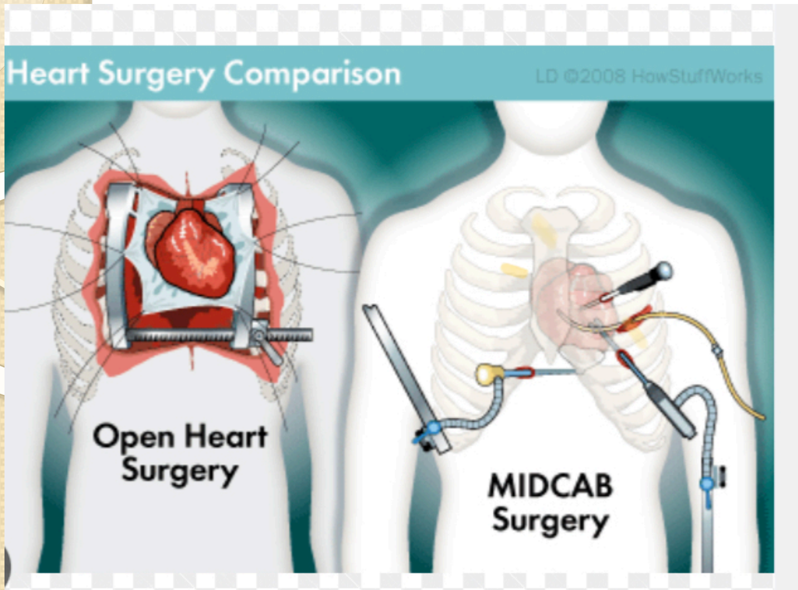
+ phẫu thuật tim, ngực trước đó

+ dị dạng lồng ngực, béo phì (hạn chế)

+ tắc nhiều nhánh mạch vành (cần phối hợp với BS can thiệp)



Left Internal
Mammry Artery
Aorta
Saphenous Vein
Bypass Grafts
Circumflex Coronary
Artery
Diagonal Branch of LAD
Left Anterior Descending
(LAD) Coronary Artery
Right Coronary
Artery


Heart Surgery Comparison
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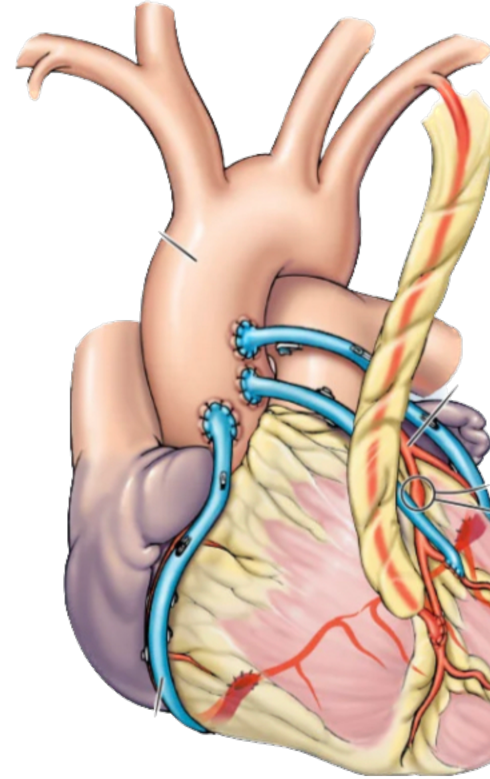
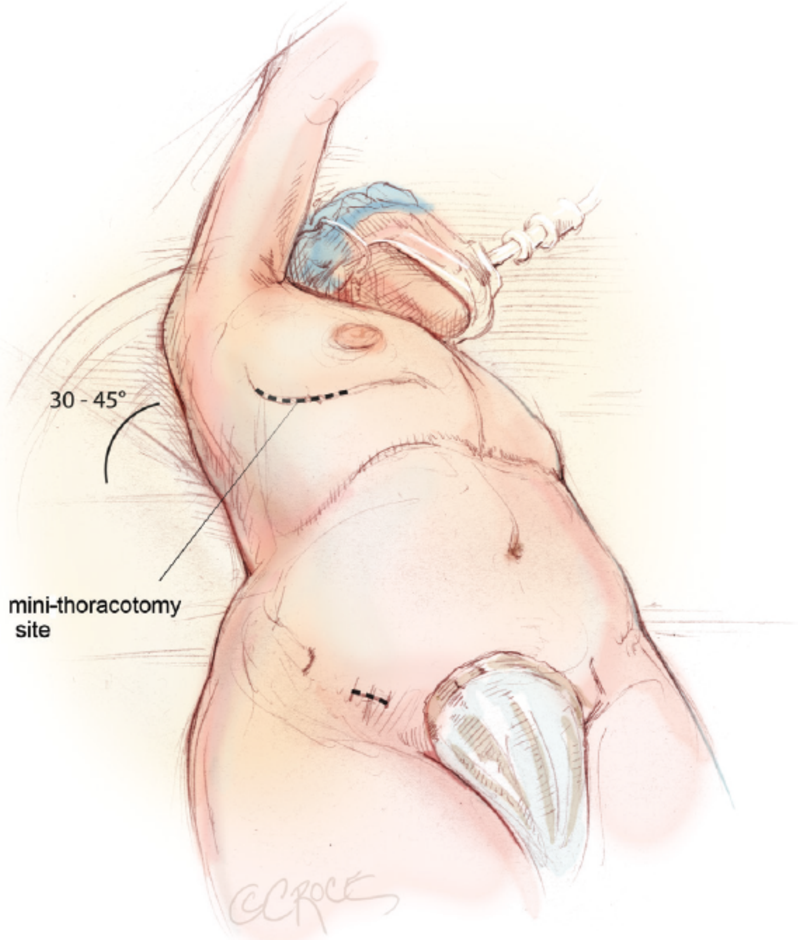
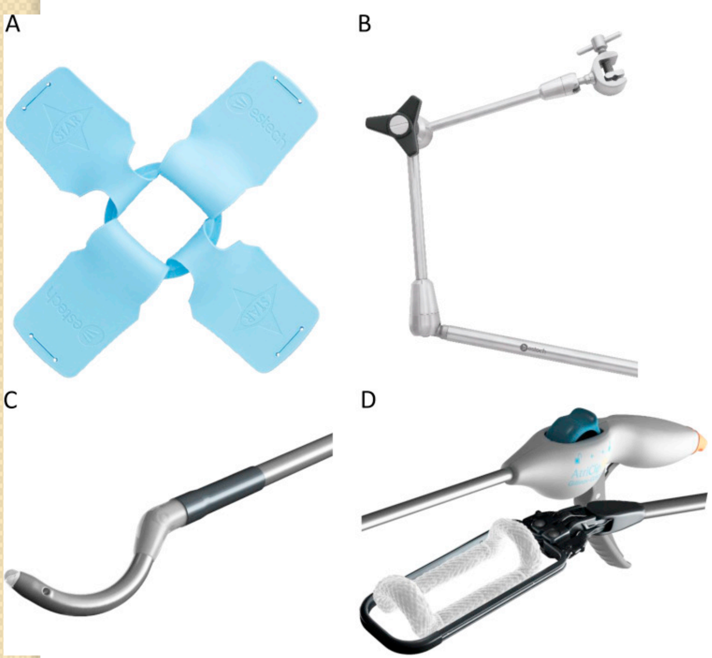
Open Heart Surgery
MIDCAB Surgery

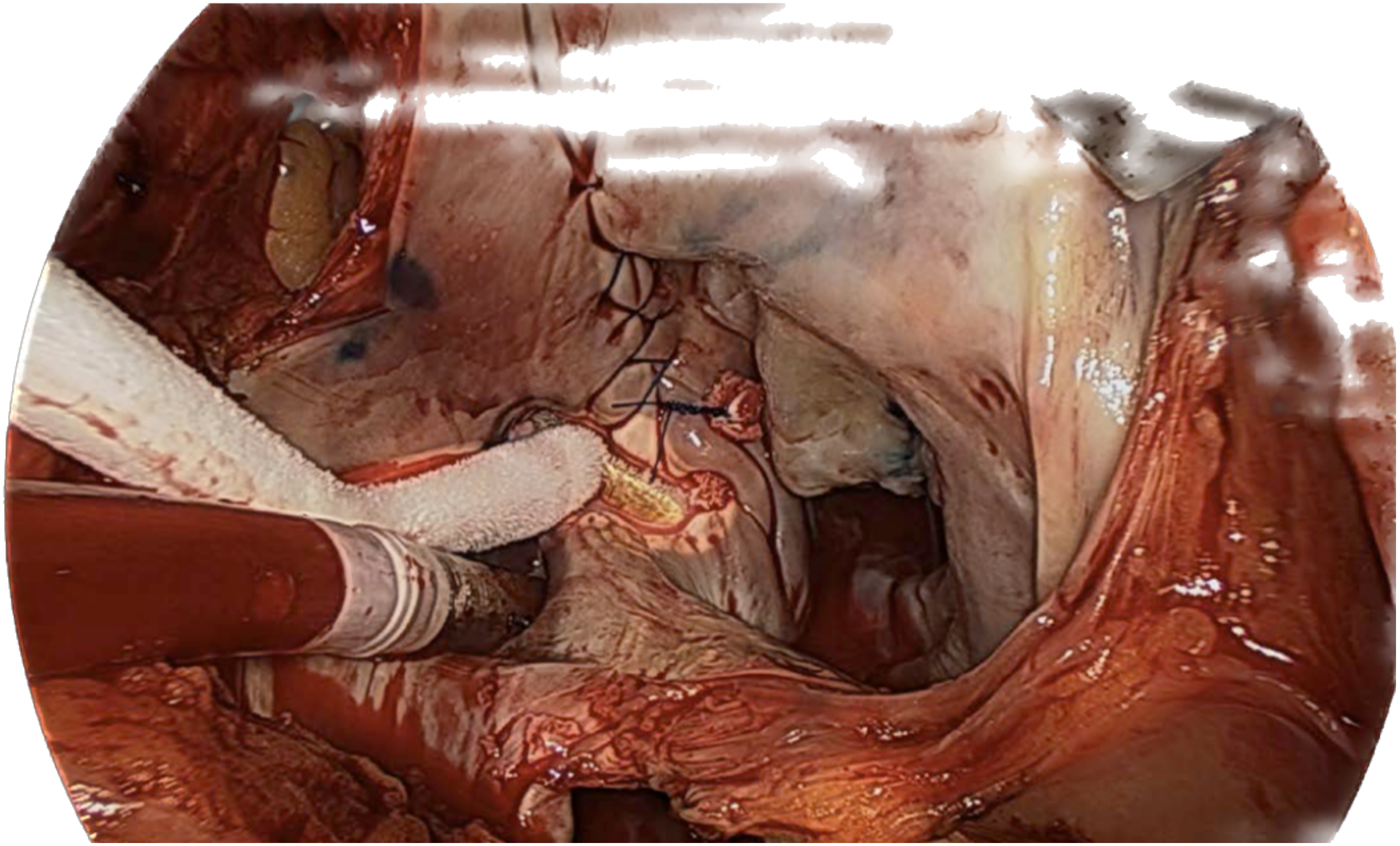


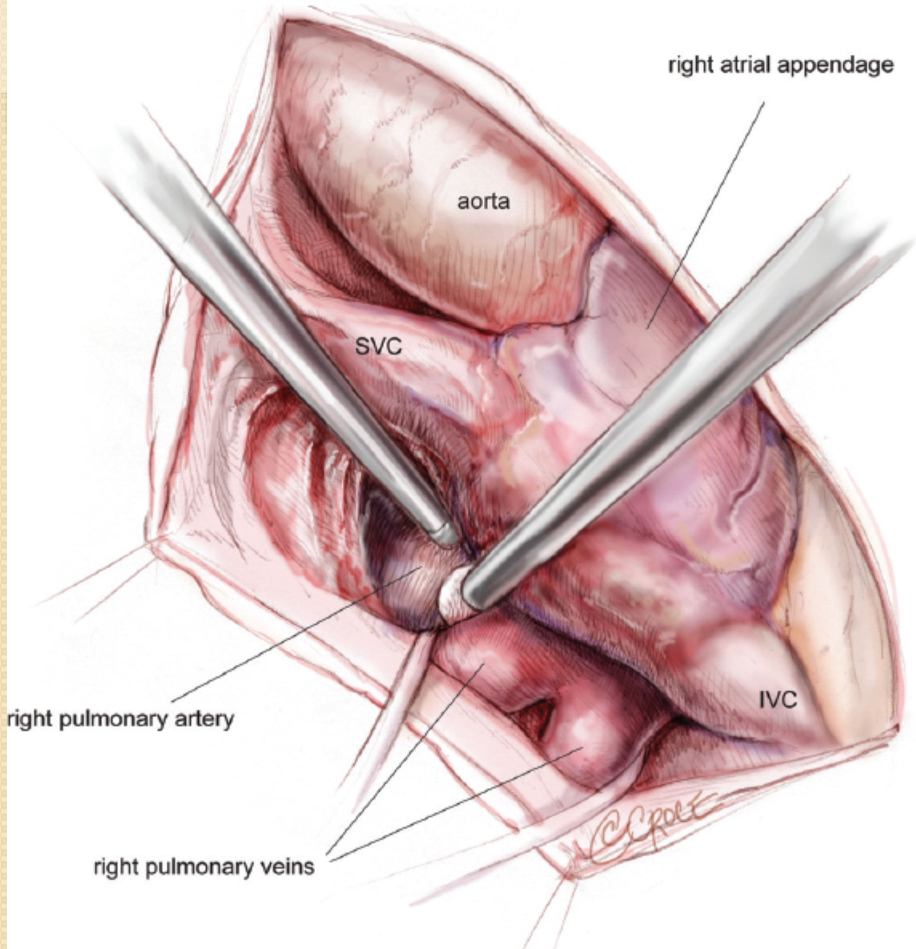
Đốt AF ít xâm lấn

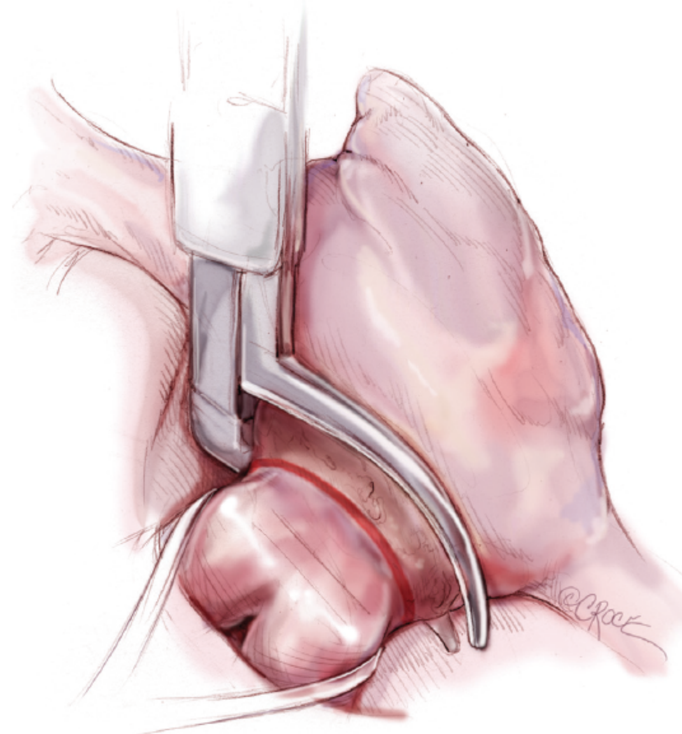


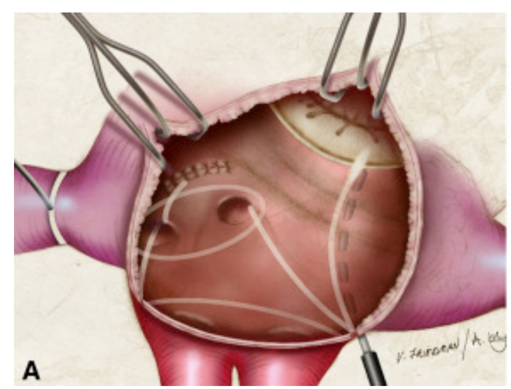
Một số dụng cụ đốt AF

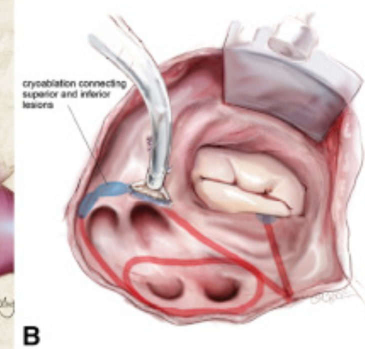


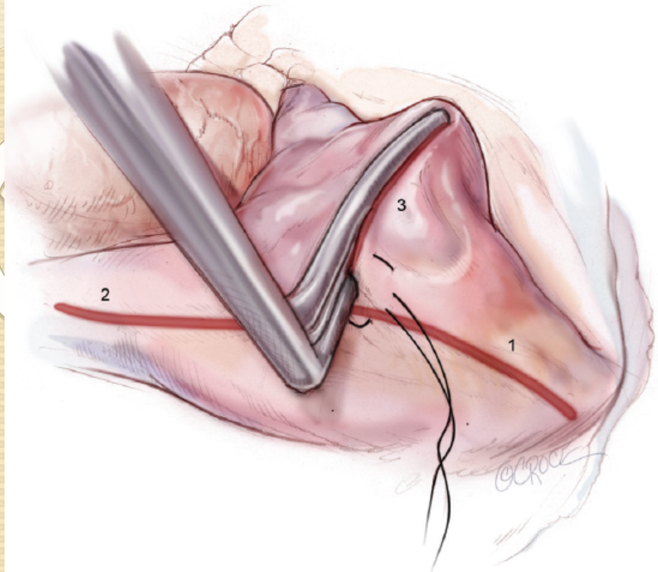



right atrial appendage
aorta
SVC
right pulmonary artery
IVC
right pulmonary veins






cryoablation connecting superior and inferior lesions
B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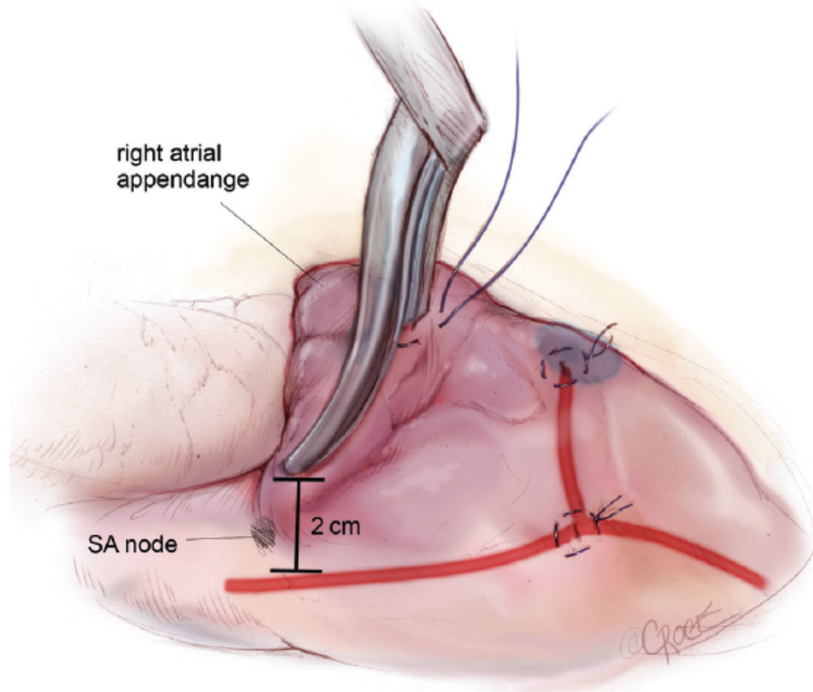
right atrial
appendange
2 cm
SA node
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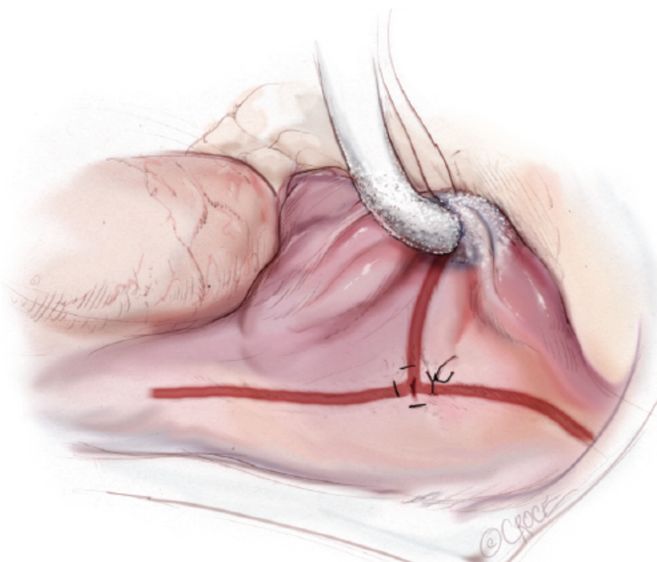
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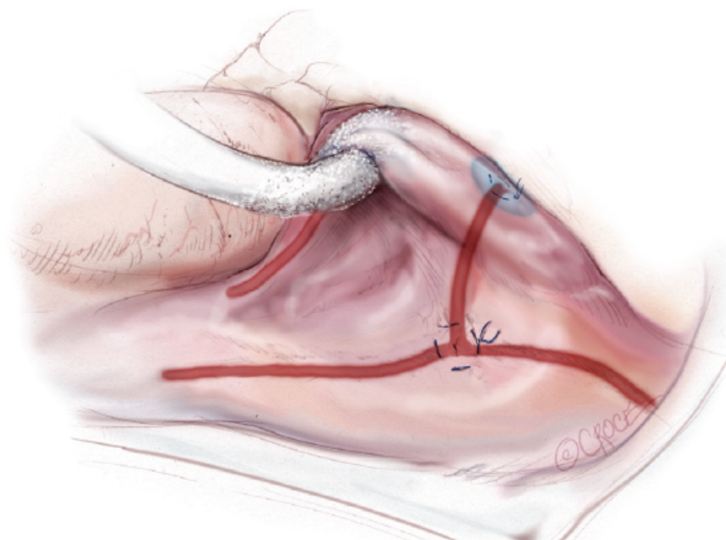
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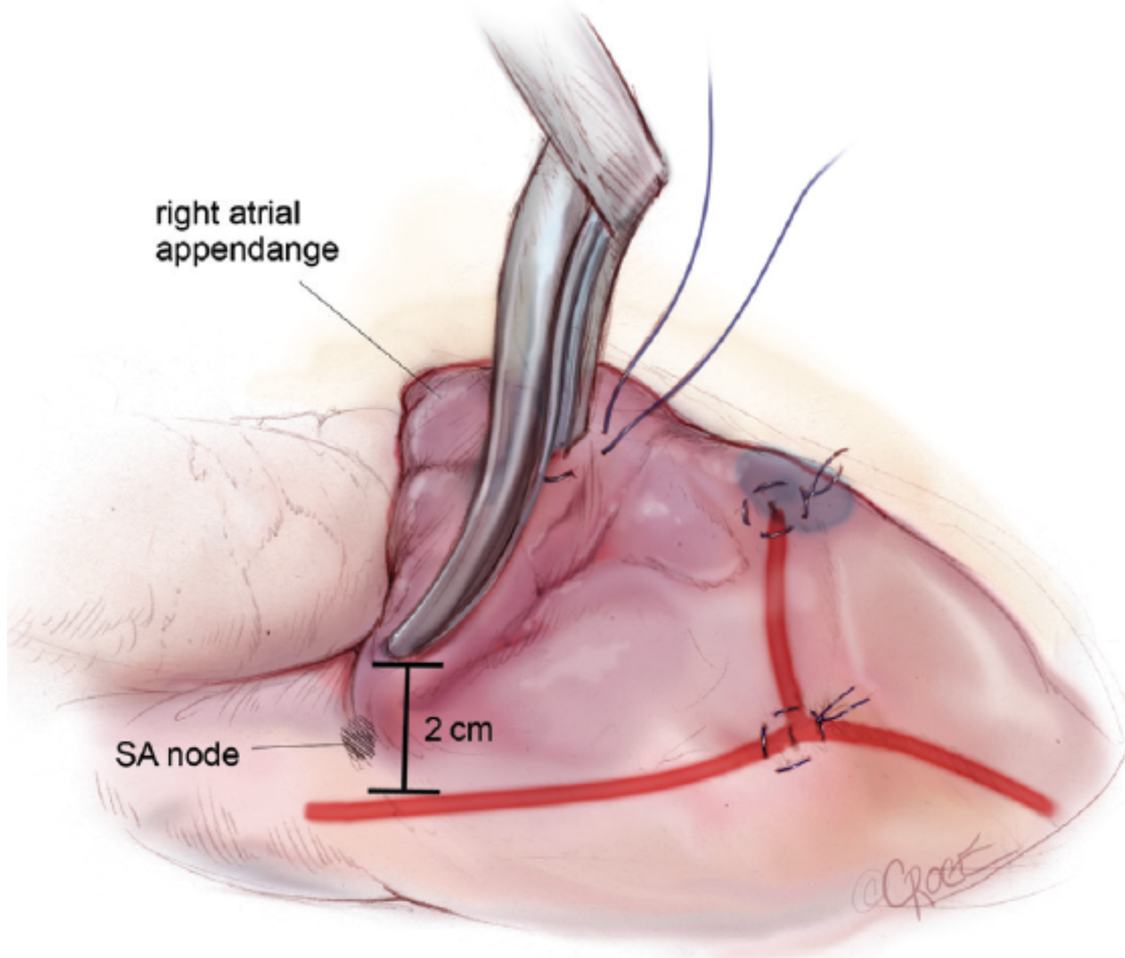
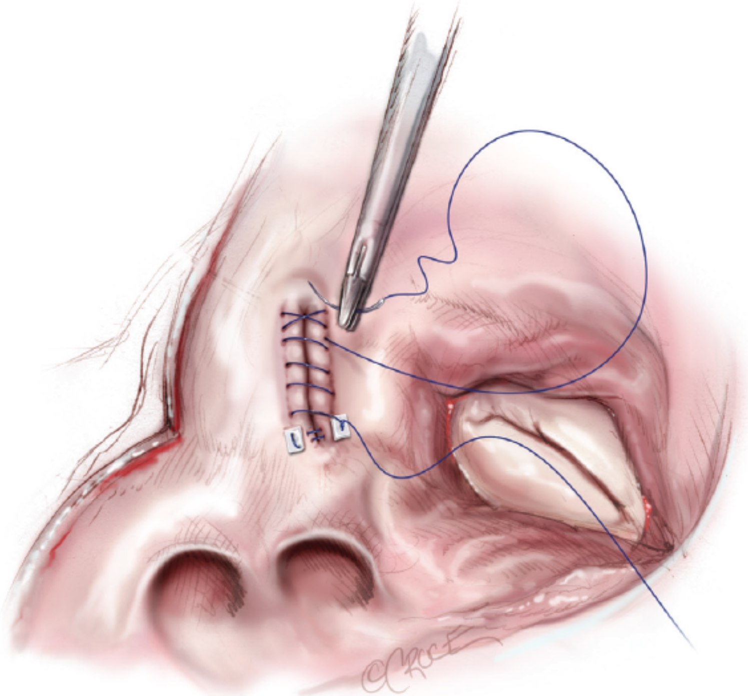
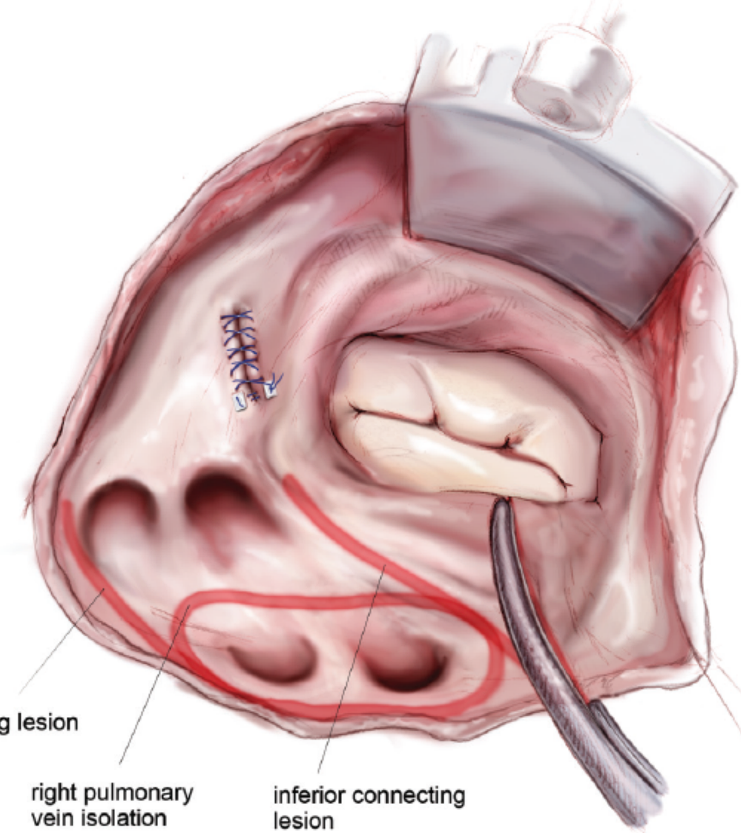
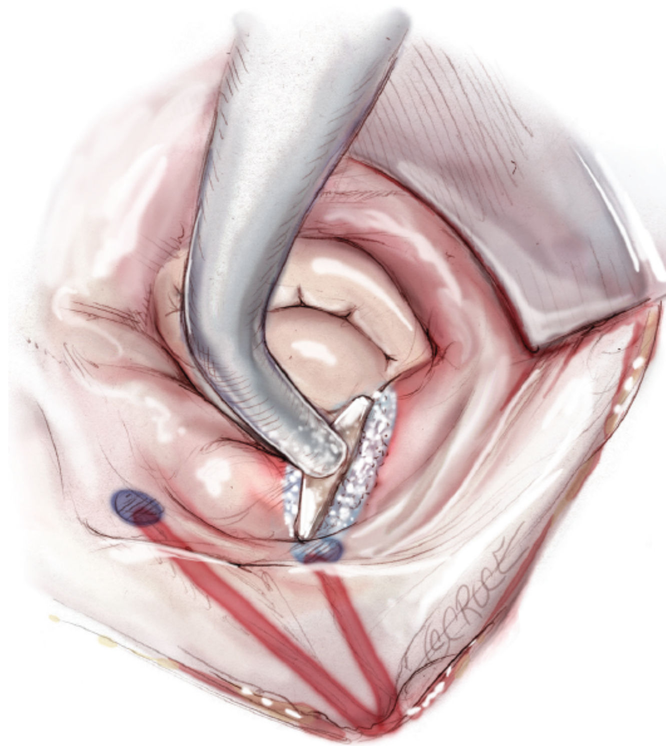
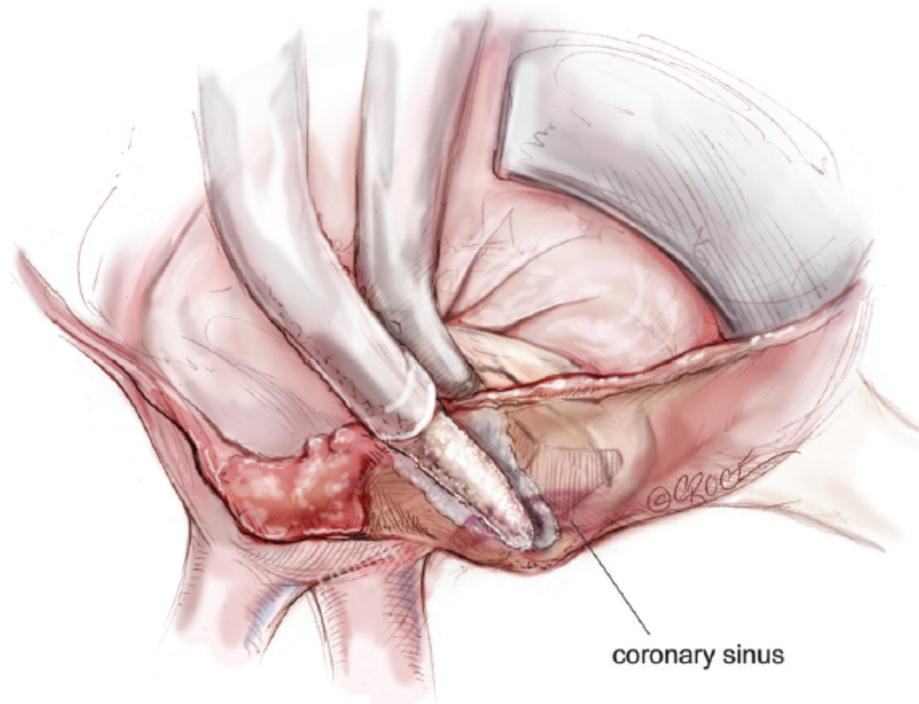

right atrial
appendange
2 cm
SA node
©Croot




superior
connecting lesion
right pulmonary
vein isolation
inferior connecting
lesion

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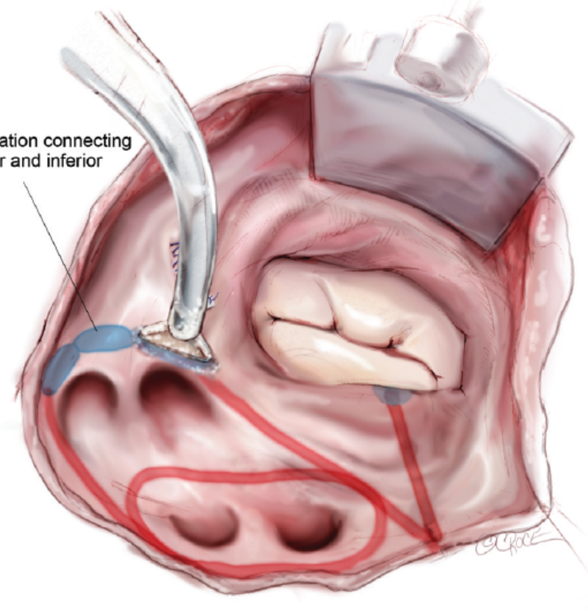

cryoablation connecting
superior and inferior
lesions

Minimally invasive Cox-Maze IV procedure

- Functional class < IV
- Ejection fraction better than 30 %
- Permanent or Continuous AF more than 6 month in structural mitral valve disease
- Medical document not long history AF
- Lt atrium size < 70 mm
- First time open heart operation
- LA wall no severe calcification

Minimally invasive Cox-Maze IV procedure

- Một số BN không phù hợp :

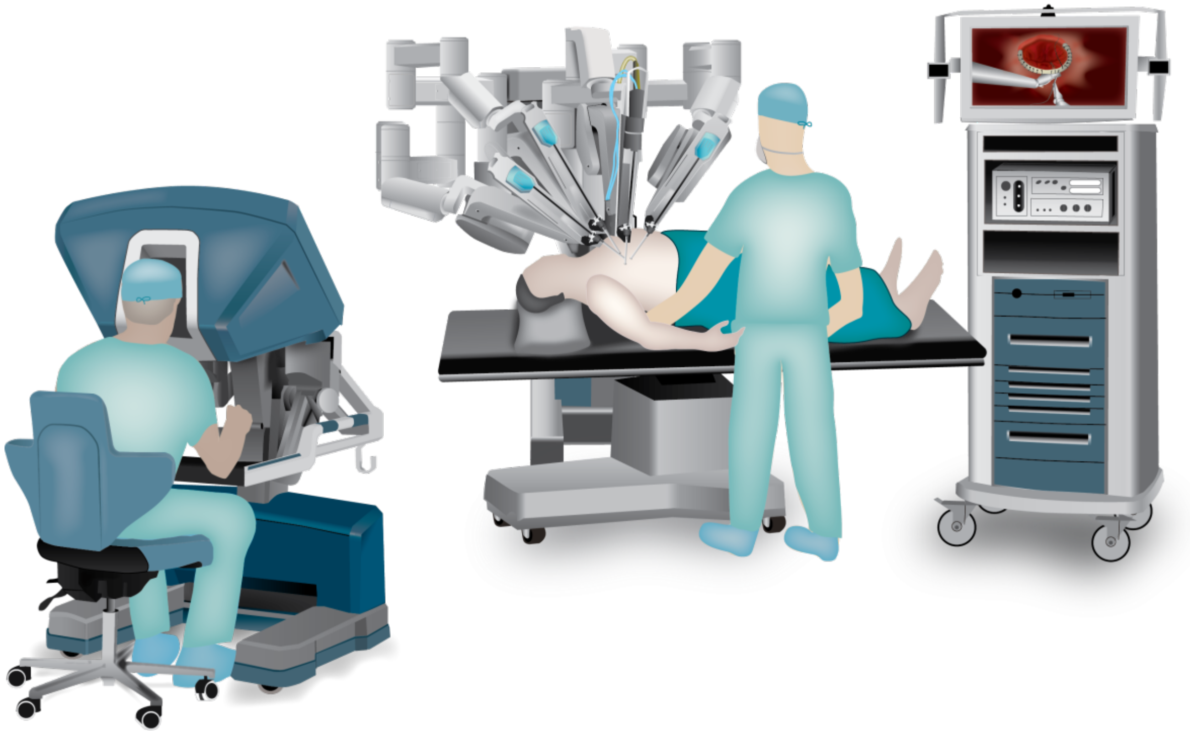
+ phẫu thuật cấp cứu

+ bệnh mạch ngoại vi nặng

+ phẫu thuật tim, ngực trước đó

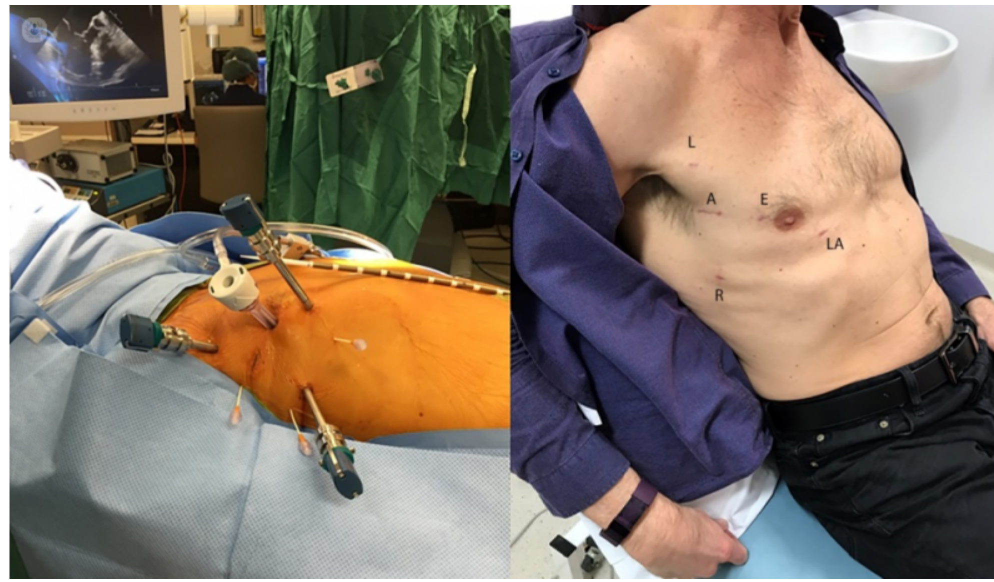
+ dị dạng lồng ngực, béo phì (hạn chế)

Robotic Heart Surgery



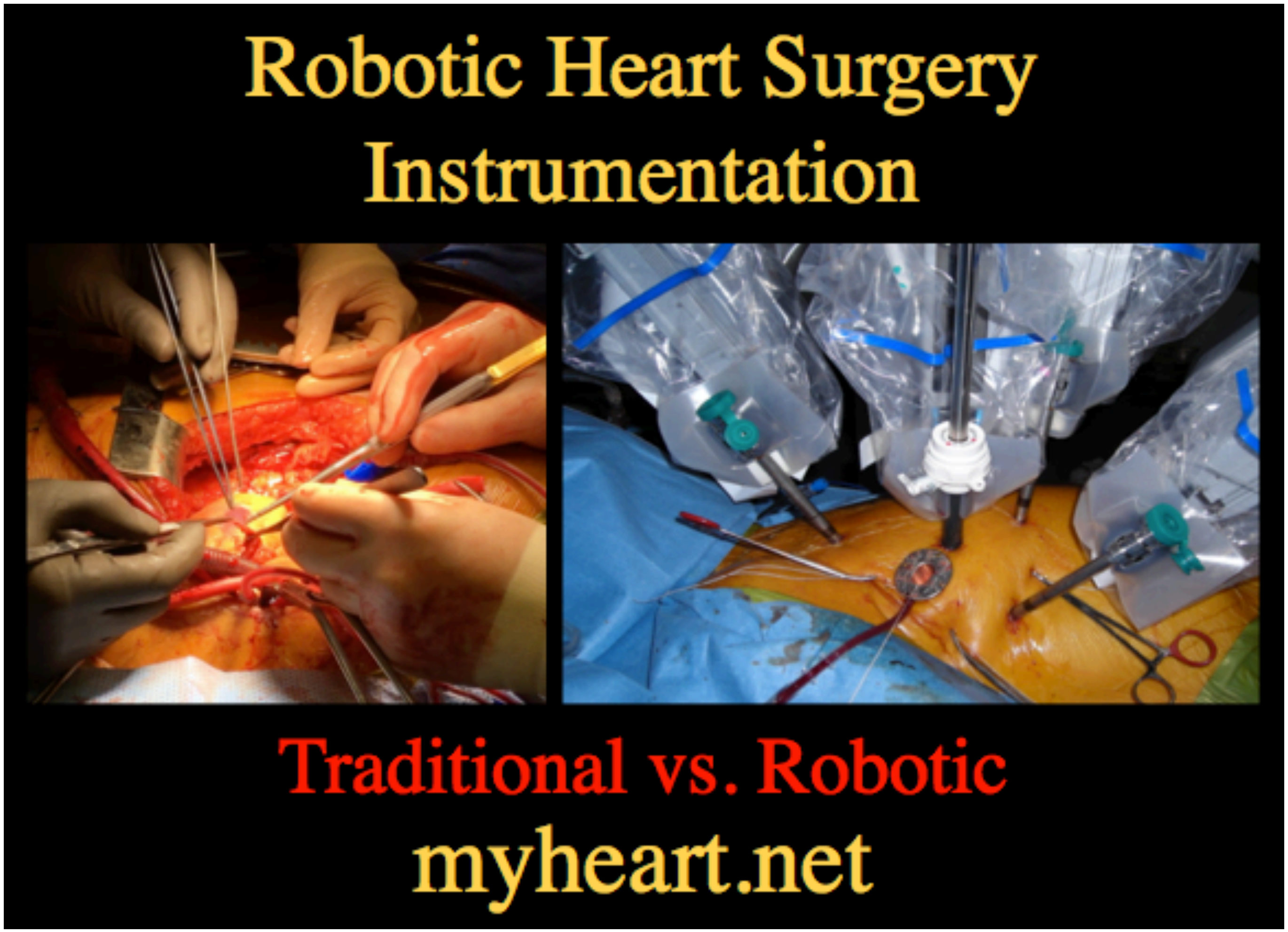
Mổ thường

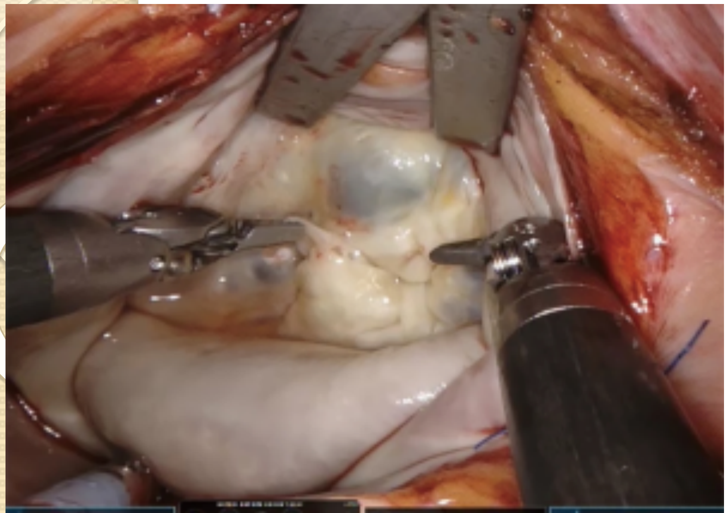
Robot

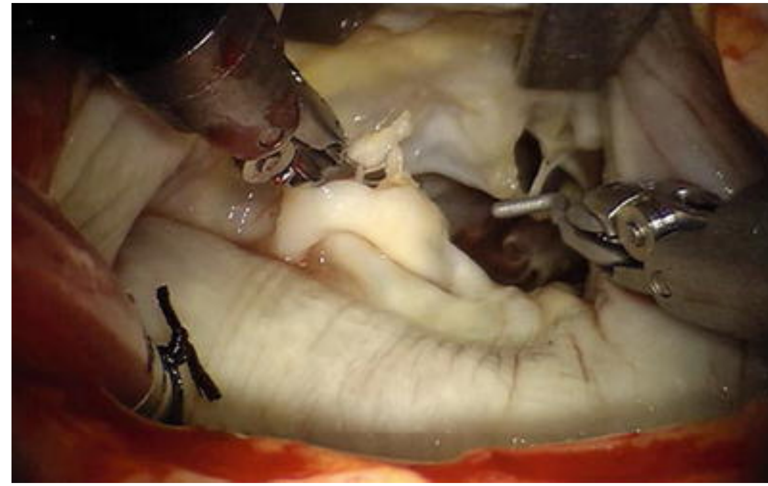


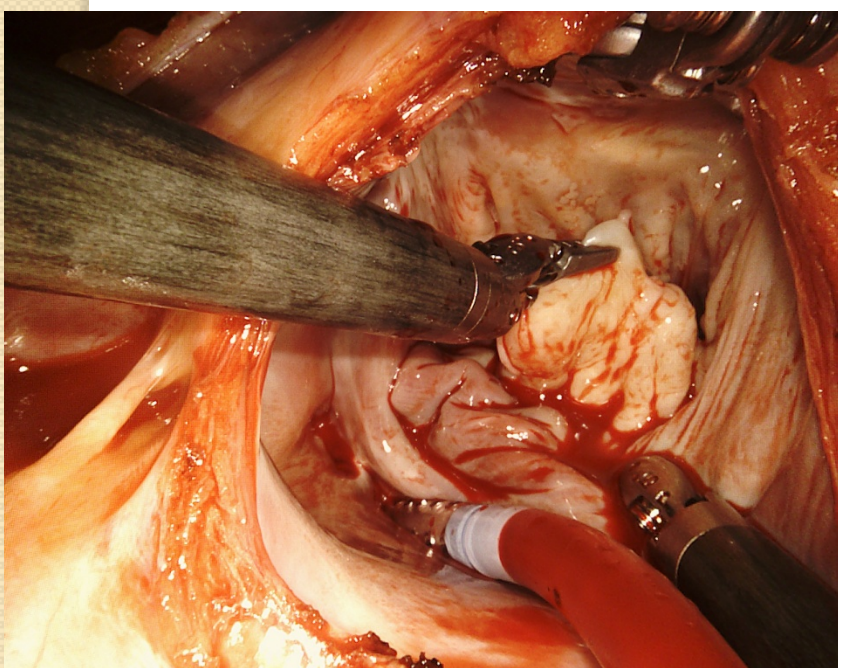
Benefits of Robotic Cardiac Surgery

- Significantly less pain
- Small surgical area
- Less scarring
- Less blood transfusion
- Less bleeding
- Minimal infection risks
- Shorter hospital stay
- Faster recovery time


Robotic Heart Surgery
Instrumentation
Traditional vs. Robotic
myheart.net



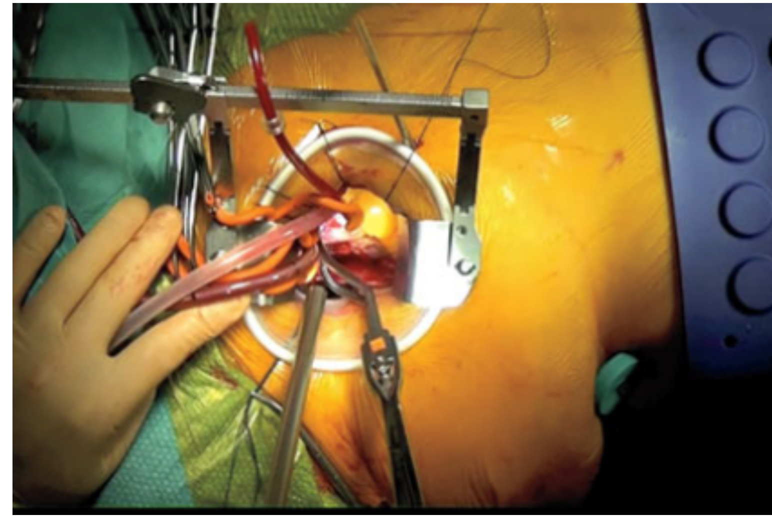


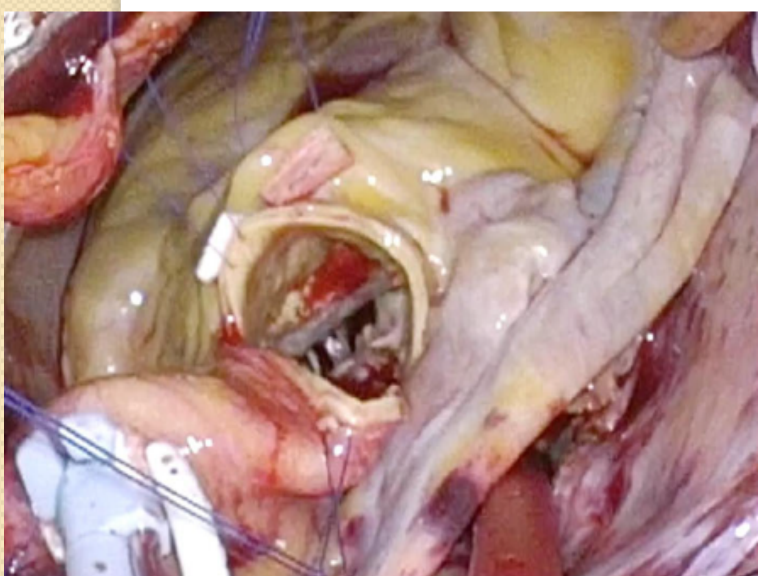


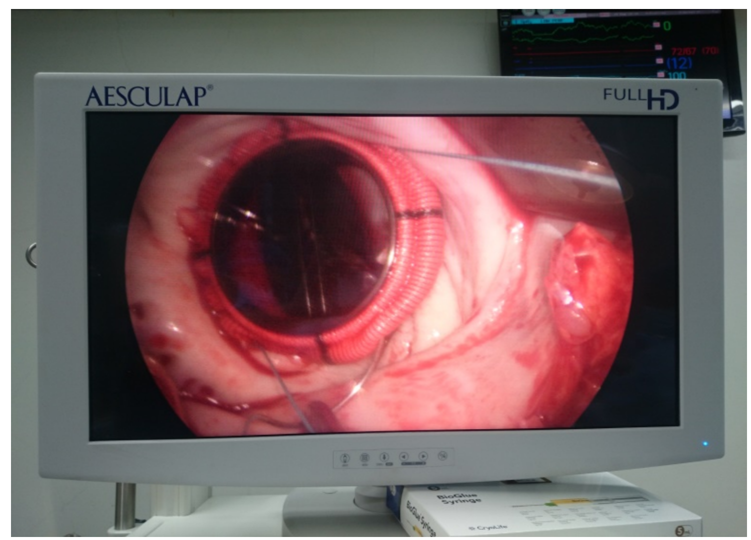
Robotic Heart Surgery

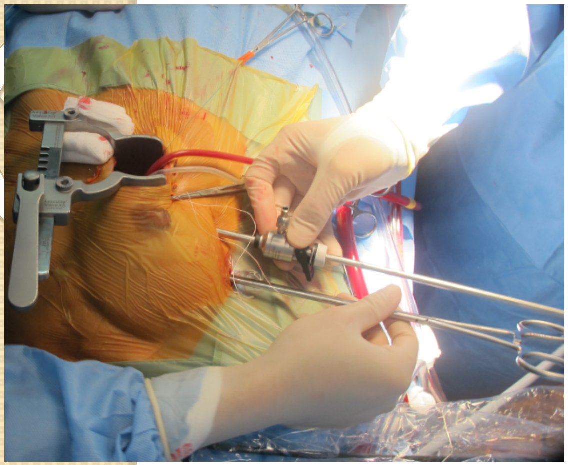
Types of Heart Surgery that can be Performed Robotically

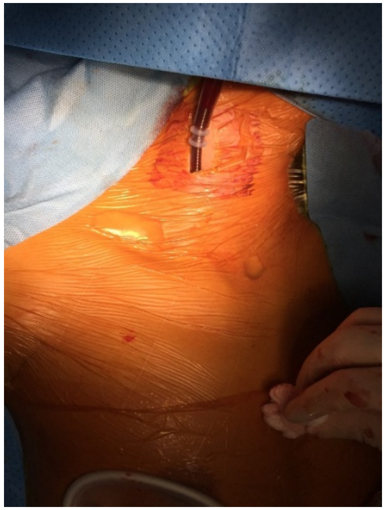
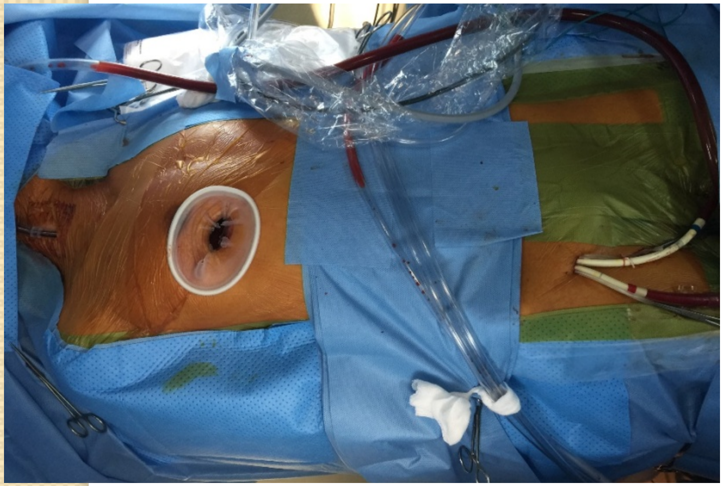
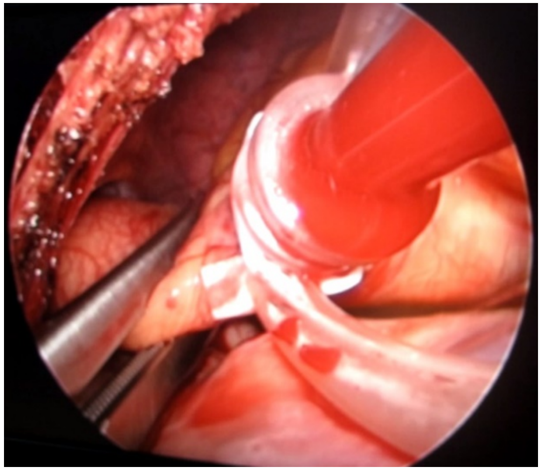
- Mitral valve repair or replacement
- Maze procedures (to treat atrial fibrillation)
- Atrial septal defect (ASD) closure
- Removal of cardiac tumor (such as atrial myxoma)
- Tricuspid valve repair or replacement
- Septal myectomy for obstruction hypertrophic cardiomyopathy (HOCM)
- Coronary artery bypass
- Pacemaker lead placement





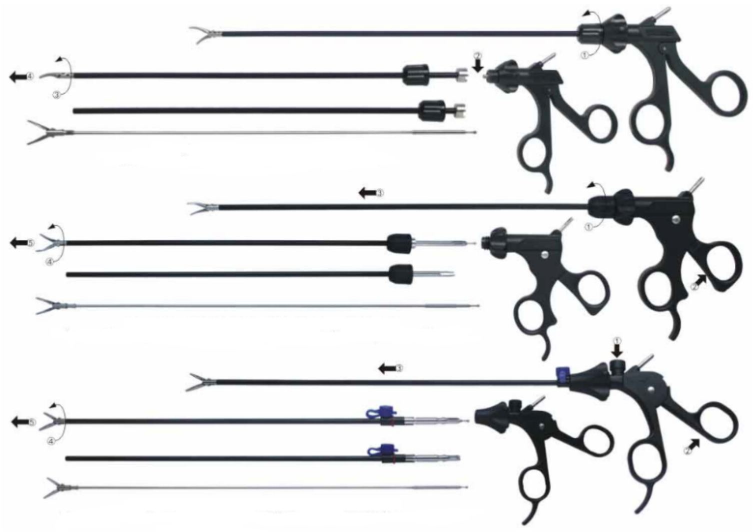

AESCULAP
FULL HD

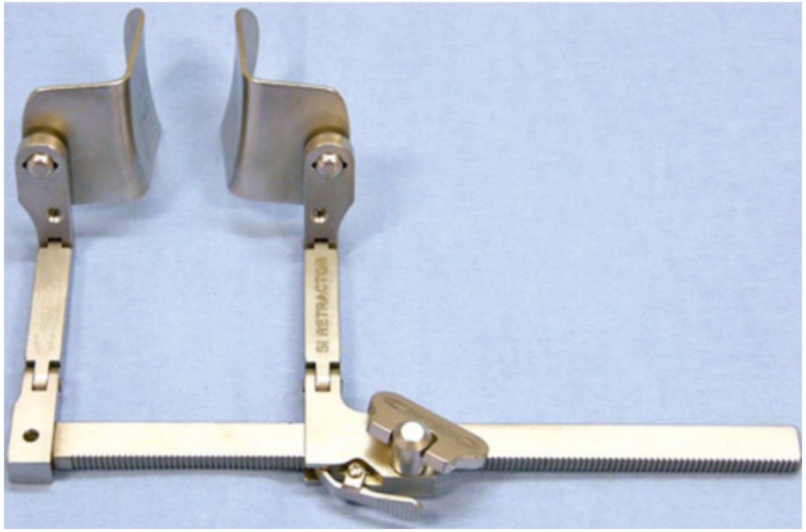





KARL STORZ — ENDOSKOPE




SI RETRACTOR


THANK YOU
FOR YOUR
ATTENTION