EXTRACÇÃO PERCUTÂNEA DE ELÉCTRODOS: INDICAÇÕES, TÉCNICAS E RESULTADOS

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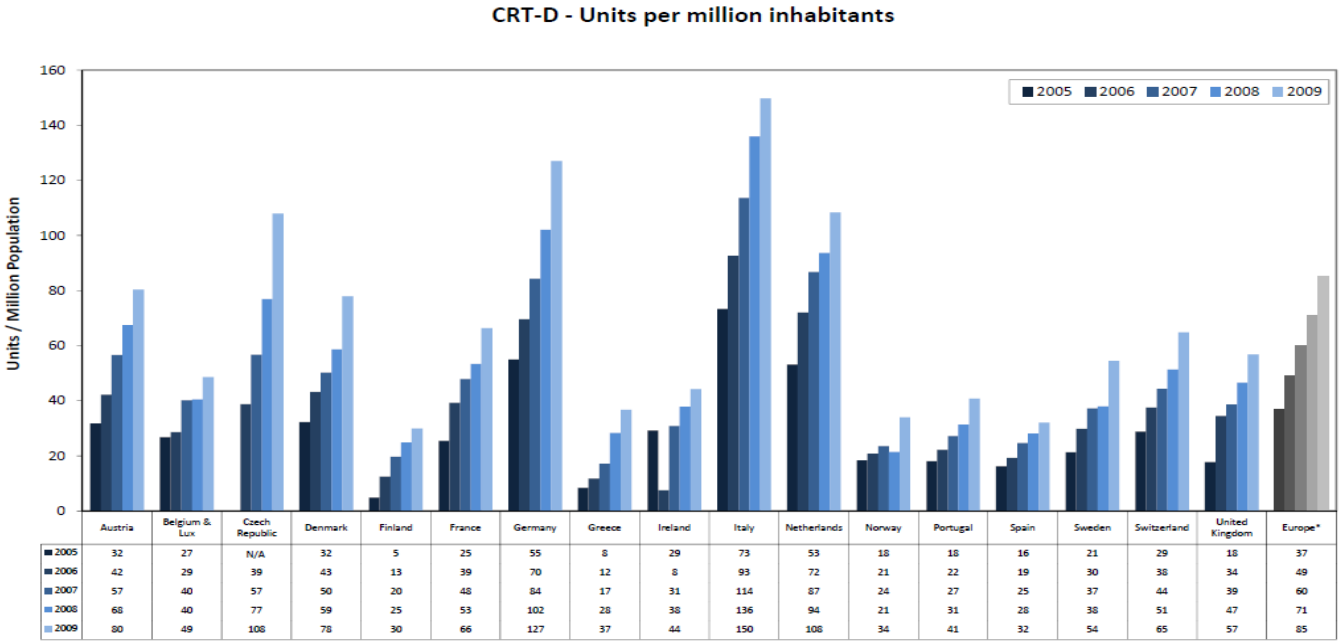
Congresso
Novas Fronteiras em Cardiologia
7 a 9 de Fevereiro de 2014

HOSPITAL DE SANTA MARTA

DISPOSITIVOS IMPLANTADOS EU



	Austria	Belgium & Lux	Czech Republic	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland	United Kingdom	Europe*
2005	32	27	N/A	32	5	25	55	8	29	73	53	18	18	16	21	29	18	37
2006	42	29	39	43	13	39	70	12	8	93	72	21	22	19	30	38	34	49
2007	57	40	57	50	20	48	84	17	31	114	87	24	27	25	37	44	39	60
2008	68	40	77	59	25	53	102	28	38	136	94	21	31	28	38	51	47	71
2009	80	49	108	78	30	66	127	37	44	150	108	34	41	32	54	65	57	85

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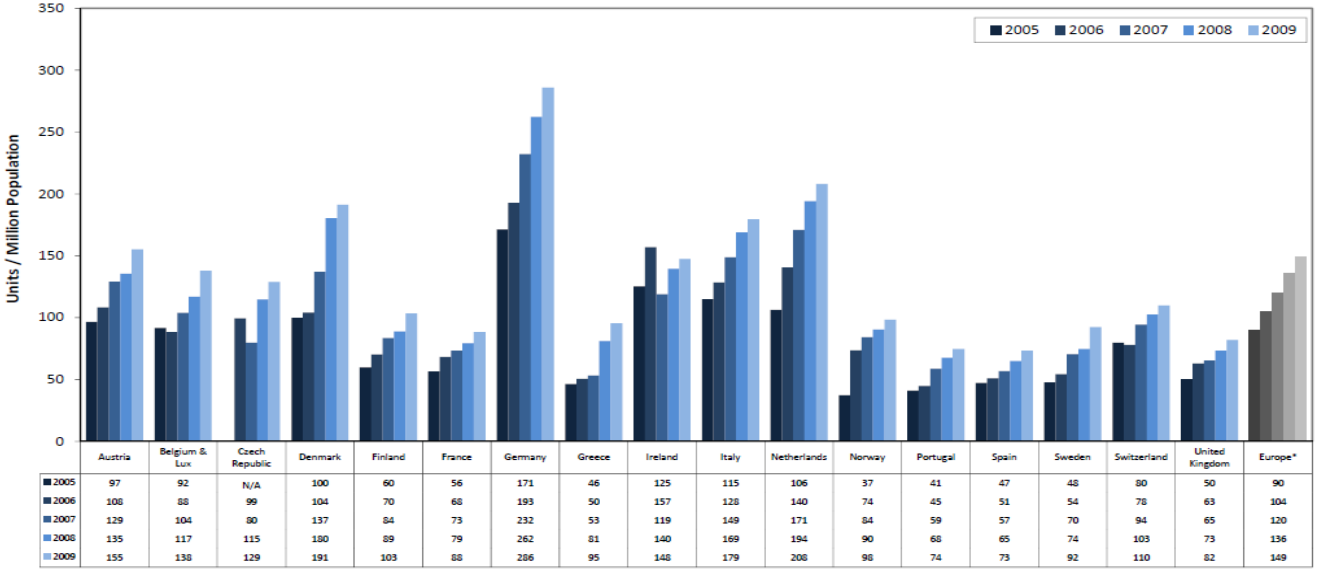
DISPOSITIVOS IMPLANTADOS EU

Defibrillators - Units per million inhabitants



	Austria	Belgium & Lux	Czech Republic	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland	United Kingdom	Europe*
2005	97	92	N/A	100	60	56	171	46	125	115	106	37	41	47	48	80	50	90
2006	108	88	99	104	70	68	193	50	157	128	140	74	45	51	54	78	63	104
2007	129	104	80	137	84	73	232	53	119	149	171	84	59	57	70	94	65	120
2008	135	117	115	180	89	79	262	81	140	169	194	90	68	65	74	103	73	136
2009	155	138	129	191	103	88	286	95	148	179	208	98	74	73	92	110	82	149

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DISPOSITIVOS IMPLANTADOS

TODAY IN EUROPE IT IS ESTIMATED THAT AROUND 290,000 PACEMAKERS OF VARIOUS TYPES ARE IMPLANTED EACH YEAR, WITH 50% OF THESE BEING IMPLANTED TO TREAT DISTURBANCES OF SINUS NODE FUNCTION AND THE REMAINDER BECAUSE OF VARIOUS DEGREES OF IMPAIRMENT OF THE ATRIOVENTRICULAR CONDUCTION.

- **INFECTION IS A SERIOUS COMPLICATION OF CEID SYSTEMS.**

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TERMINOLOGIA NA REMOÇÃO DE EC

LEAD REMOVAL ➔ **REMOÇÃO DE EC´S DE PMD OU DESFIBRILADOR UTILIZANDO QUALQUER TÉCNICA**

LEAD EXPLANT ➔ **TÉCNICAS SIMPLES DE TRAÇÃO (<1 A)**

LEAD EXTRACTION ➔ **REMOÇÃO REQUER O AUXÍLIO DE EQUIPAMENTOS ESPECIALIZADOS**

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INDICAÇÕES PARA REMOÇÃO DE EC

Transvenous Lead Extraction: Heart Rhythm Society Expert Consensus on Facilities, Training, Indications, and Patient Management

This document was endorsed by the American Heart Association (AHA).

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INDICAÇÕES PARA REMOÇÃO

A REMOÇÃO DE SISTEMA DCEI DEVE SER APENAS CONSIDERADA SE:

- BENEFICIO JUSTIFIQUE O RISCO ASSOCIADO AO PROCEDIMENTO

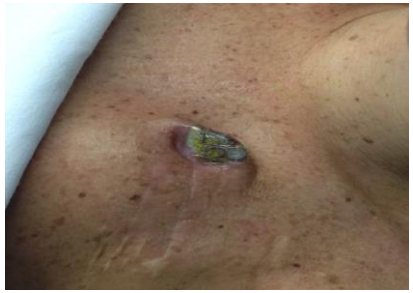
- **CARACTERÍSTICAS DE CADA DOENTE**
- **EXPERIÊNCIA DO OPERADOR**
- **TÉCNICA UTILIZADA (??)**

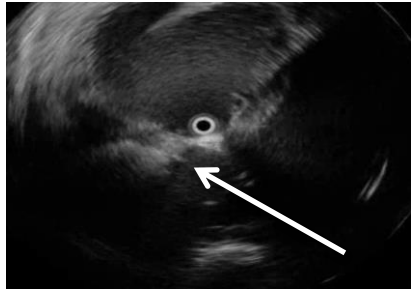
WILKOFF BL ET AL. TRANSVENOUS LEAD EXTRACTION: HEART RHYTHM SOCIETY EXPERT CONSENSUS ON FACILITIES, TRAINING, INDICATIONS, AND PATIENT MANAGEMENT. HEART RHYTHM 2009;6:1085 – 104.

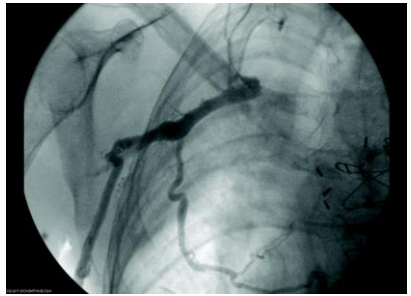
INDICAÇOES PARA REMOÇÃO

- INFECÇÃO (~70% ; 28% (S) ; 42% (L)[1])

- DOR CRÓNICA
- TROMBOSE / ESTENOSE VENOSA
- REMOÇÃO:
  - ELECTRODOS FUNCIONANTES
  - ELECTRODOS DISFUNCIONANTES







CURRENT PRACTICE IN TRANSVENOUS LEAD EXTRACTION: A EUROPEAN HEART RHYTHM ASSOCIATION EP NETWORK SURVEY.
MARIA GRAZIA BONGIORNI ET AL BY THE SCIENTIFIC INITIATIVE COMMITTEE, EUROPEAN HEART RHYTHM ASSOCIATION

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AUMENTO DAS INFECÇÕES

- DOENTES COM MAIS COMORBILIDADES
- DISPOSITIVOS QUE REQUEREM MAIS EC / PTS
- UPGRADING DE DISPOSITIVOS + FREQUÊNTE
- OPERADORES MENOS EXPERIENTES

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REMOÇÃO - INFECÇÃO

Infection

Class I

1. Complete device and lead removal is recommended in all patients with definite CIED system infection, as evidenced by valvular endocarditis, lead endocarditis or sepsis. *(Level of evidence: B)*
2. Complete device and lead removal is recommended in all patients with CIED pocket infection as evidenced by pocket abscess, device erosion, skin adherence, or chronic draining sinus without clinically evident involvement of the transvenous portion of the lead system. *(Level of evidence: B)*
3. Complete device and lead removal is recommended in all patients with valvular endocarditis without definite involvement of the lead(s) and/or device. *(Level of evidence: B)*
4. Complete device and lead removal is recommended in patients with occult gram-positive bacteremia (not contaminant). *(Level of evidence: B)*

Class IIa

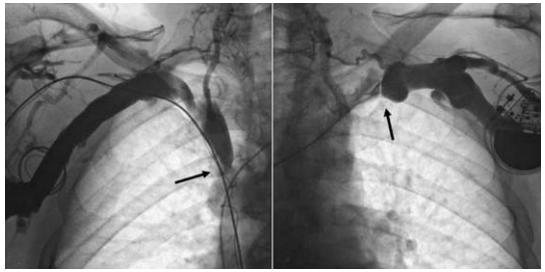
1. Complete device and lead removal is reasonable in patients with persistent occult gram-negative bacteremia. *(Level of evidence: B)*

Class III

1. CIED removal is not indicated for a superficial or incisional infection without involvement of the device and/or leads *(Level of evidence: C)*
2. CIED removal is not indicated to treat chronic bacteremia due to a source other than the CIED, when long-term suppressive antibiotics are required. *(Level of evidence: C)*

WILKOFF BL ET AL. TRANSVENOUS LEAD EXTRACTION: HEART RHYTHM SOCIETY EXPERT CONSENSUS ON FACILITIES, TRAINING, INDICATIONS, AND PATIENT MANAGEMENT. HEART RHYTHM 2009;6:1085 – 104.

REMOÇÃO – TROMBOSE / ESTENOSE



Thrombosis or Venous Stenosis

Class I

1. Lead removal is recommended in patients with clinically significant thromboembolic events associated with thrombus on a lead or a lead fragment. *(Level of evidence: C)*
2. Lead removal is recommended in patients with bilateral subclavian vein or SVC occlusion precluding implantation of a needed transvenous lead. *(Level of evidence: C)*
3. Lead removal is recommended in patients with planned stent deployment in a vein already containing a transvenous lead, to avoid entrapment of the lead. *(Level of evidence: C)*
4. Lead removal is recommended in patients with superior vena cava stenosis or occlusion with limiting symptoms. *(Level of evidence: C)*
5. Lead removal is recommended in patients with ipsilateral venous occlusion preventing access to the venous circulation for required placement of an additional lead when there is a contraindication for using the contralateral side (e.g. contralateral AV fistula, shunt or vascular access port, mastectomy). *(Level of evidence: C)*

Class IIa

1. Lead removal is reasonable in patients with ipsilateral venous occlusion preventing access to the venous circulation for required placement of an additional lead, when there is no contraindication for using the contralateral side. *(Level of evidence C)*

WILKOFF BL ET AL. TRANSVENOUS LEAD EXTRACTION: HEART RHYTHM SOCIETY EXPERT CONSENSUS ON FACILITIES, TRAINING, INDICATIONS, AND PATIENT MANAGEMENT. HEART RHYTHM 2009;6:1085 – 104.

REMOÇÃO – DOR CRÓNICA

Chronic Pain

Class IIa

1. Device and/or lead removal is reasonable in patients with severe chronic pain, at the device or lead insertion site, that causes significant discomfort for the patient, is not manageable by medical or surgical techniques and for which there is no acceptable alternative. *(Level of evidence: C)*

WILKOFF BL ET AL. TRANSVENOUS LEAD EXTRACTION: HEART RHYTHM SOCIETY EXPERT CONSENSUS ON FACILITIES, TRAINING, INDICATIONS, AND PATIENT MANAGEMENT. HEART RHYTHM 2009;6:1085 – 104.

REMOÇÃO – EC FUNCIONANTES

Functional Leads

Class I

1. Lead removal is recommended in patients with life threatening arrhythmias secondary to retained leads. *(Level of evidence: B)*
2. Lead removal is recommended in patients with leads that, due to their design or their failure, may pose an immediate threat to the patients if left in place. (e.g. Telectronics ACCUFIX J wire fracture with protrusion). *(Level of evidence: B)*
3. Lead removal is recommended in patients with leads that interfere with the operation of implanted cardiac devices. *(Level of evidence: B)*
4. Lead removal is recommended in patients with leads that interfere with the treatment of a malignancy (radiation/reconstructive surgery). *(Level of evidence: C)*

Class IIb

1. Lead removal may be considered in patients with an abandoned functional lead that poses a risk of interference with the operation of the active CIED system. *(Level of evidence: C)*
2. Lead removal may be considered in patients with functioning leads that due to their design or their failure pose a potential future threat to the patient if left in place. (e.g. Telectronics ACCUFIX without protrusion) *(Level of evidence: C)*
3. Lead removal may be considered in patients with leads that are functional but not being used. (i.e. RV pacing lead after upgrade to ICD) *(Level of evidence: C)*
4. Lead removal may be considered in patients who require specific imaging techniques (e.g. MRI) that can not be imaged due to the presence of the CIED system for which there is no other available imaging alternative for the diagnosis. *(Level of evidence: C)*
5. Lead removal may be considered in patients in order to permit the implantation of an MRI conditional CIED system. *(Level of*

Class III

1. Lead removal is not indicated in patients with functional but redundant leads if patients have a life expectancy of less than one year. *(Level of evidence: C)*
2. Lead removal is not indicated in patients with known anomalous placement of leads through structures other than normal venous and cardiac structures, (e.g. subclavian artery, aorta, pleura, atrial or ventricular wall or mediastinum) or through a systemic venous atrium or systemic ventricle. Additional techniques including surgical backup may be used if the clinical scenario is compelling. *(Level of evidence: C)*

REMOÇÃO – EC DISFUNCIONANTES

-MALFUNCTION ≈ 2.5 %

-1.65-20% ANNUAL ICD LEAD FAILURE BASED ON AGE [1,2]

1 HAUSER, ROBERT ET AL. THE INCRESING HAZARD OF SPRING FIDELIS IMPLANTABLE CARDIOVERTER-DEFIBRILATOR LEAD FAILURE, HEART RHYTHM, VOL 6, NO5, MAY 2009
2 KLEEMAN THOMAS, ET AL. ANNUAL RATE OF TRANSVENOUS DEFIBRILATION LEAD DEFECT IN IMPLANTABLE-DEFIBRILATORS OVER A PERIOD OF >10 YEARS. CIRCULATION 2007, 115:2474-2490

EXTRACÇÃO – EC DISFUNCIONANTES

Non Functional Leads

Class I

1. Lead removal is recommended in patients with life threatening arrhythmias secondary to retained leads or lead fragments. *(Level of evidence: B)*
2. Lead removal is recommended in patients with leads that, due to their design or their failure, may pose an immediate threat to the patients if left in place. (e.g. Telectronics ACCUFIX J wire fracture with protrusion) *(Level of evidence: B)*
3. Lead removal is recommended in patients with leads that interfere with the operation of implanted cardiac devices. *(Level of evidence: B)*
4. Lead removal is recommended in patients with leads that interfere with the treatment of a malignancy (radiation/reconstructive surgery). *(Level of evidence: C)*

Class IIa

1. Lead removal is reasonable in patients with leads that due to their design or their failure pose a threat to the patient, that is not immediate or imminent if left in place. (e.g. Telectronics ACCUFIX without protrusion) *(Level of evidence C)*
2. Lead removal is reasonable in patients if a CIED implantation would require more than 4 leads on one side or more than 5 leads through the SVC. *(Level of evidence C)*
3. Lead removal is reasonable in patients that require specific imaging techniques (e.g. MRI) and can not be imaged due to the presence of the CIED system for which there is no other available imaging alternative for the diagnosis. *(Level of evidence: C)*

Class IIb

1. Lead removal may be considered at the time of an indicated CIED procedure, in patients with non-functional leads, if contraindications are absent. *(Level of evidence C)*
2. Lead removal may be considered in order to permit the implantation of an MRI conditional CIED system. *(Level of evidence: C)*

Class III

1. Lead removal is not indicated in patients with non-functional leads if patients have a life expectancy of less than one year. *(Level of evidence C)*
2. Lead removal is not indicated in patients with known anomalous placement of leads through structures other than normal venous and cardiac structures, (e.g. subclavian artery, aorta, pleura, atrial or ventricular wall or mediastinum) or through a systemic venous atrium or systemic ventricle. Additional techniques including surgical backup may be used if the clinical scenario is compelling. *(Level of evidence: C)*

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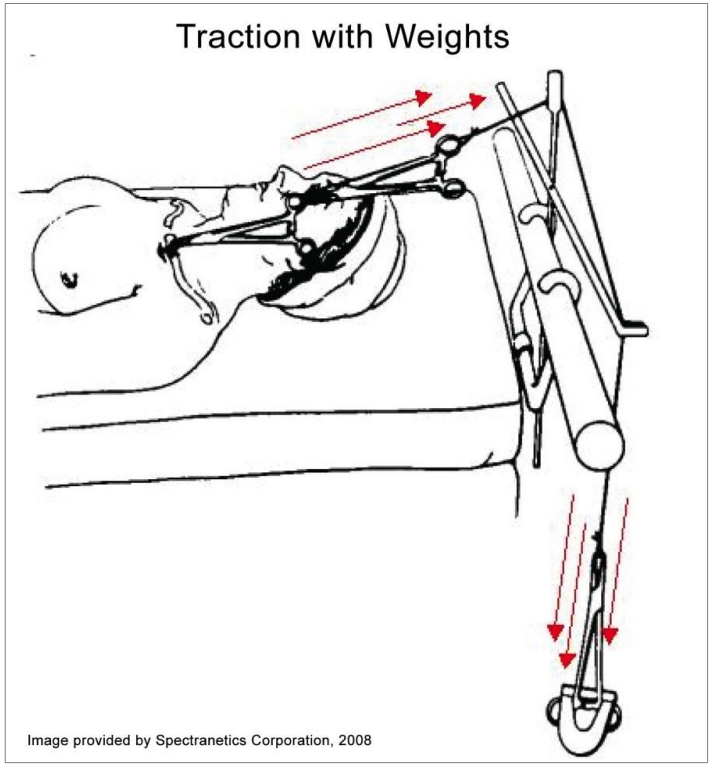
TÉCNICAS DE EXTRACÇÃO DE EC



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PERCUTÂNEA vs CIRÚRGICA

Table 24 Cardiac device-related infective endocarditis (CDRIE): treatment and prevention

Recommendations: IE on pacemakers and implantable defibrillators	Class[a]	Level[b]
A - PRINCIPLES OF TREATMENT:		
Prolonged antibiotic therapy and device removal are recommended in definite CDRIE	I	B
Device removal should be considered when CDRIE is suspected on the basis of occult infection without other apparent source of infection	IIa	C
In patients with native or prosthetic valve endocarditis and an intracardiac device with no evidence of associated device infection, device extraction may be considered	IIb	C
B - MODE OF DEVICE REMOVAL:		
Percutaneous extraction is recommended in most patients with CDRIE, even those with large (> 10 mm) vegetations	I	B
Surgical extraction should be considered if percutaneous extraction is incomplete or impossible or when there is associated severe destructive tricuspid IE	IIa	C
Surgical extraction may be considered in patients with very large (> 25 mm) vegetations	IIb	C
C – REIMPLANTATION:		
After device extraction, reassessment of the need for reimplantation is recommended	I	B
When indicated, reimplantation should be postponed if possible to allow a few days or weeks of antibiotic therapy	IIa	B
Temporary pacing is not recommended	III	C
D - PROPHYLAXIS		
Routine antibiotic prophylaxis is recommended before device implantation	I	B

[a]Class of recommendation.
[b]Level of evidence.

European Heart Journal (2009) 30, 2369–2413

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TÉCNICAS DE EXTRACÇÃO DE EC

MECHANICAL SHEATHS (POLYPROPYLENE)

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TÉCNICAS DE EXTRACÇÃO DE EC

POWERED:

ROTATING THREADED TIP (EVOLUTION)

LASER SHEATHS

ELECTROSURGICAL SHEATHS (RF)

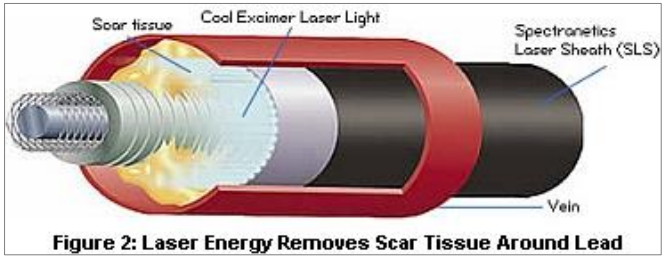
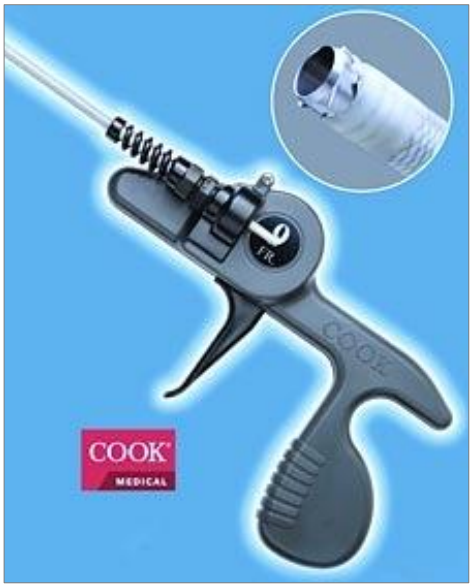


Figure 2: Laser Energy Removes Scar Tissue Around Lead



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TAXA DE SUCESSO E COMPLICAÇÕES

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Pacemaker Lead Extraction With the Laser Sheath: Results of the Pacing Lead Extraction With the Excimer Sheath (PLEXES) Trial

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Cleveland, Ohio; Fort Lauderdale, Florida; Columbus, Ohio; Rochester, Minnesota; Colorado Springs, Colorado; Burbank, California; Newark, New Jersey; Boston, Massachusetts, and Durham, North Carolina

RESULTS (301 pts): COMPLETE LEAD REMOVAL RATE WAS 94% (L) VS 64% (M)

POTENTIALLY LIFE-THREATENING COMPLICATIONS OCCURRED IN NONE OF THE NONLASER AND THREE OF THE LASER PATIENTS, INCLUDING ONE DEATH

CONCLUSIONS: LASER-ASSISTED PACEMAKER LEAD EXTRACTION HAS SIGNIFICANT CLINICAL ADVANTAGES OVER EXTRACTION WITHOUT LASER TOOLS AND IS ASSOCIATED WITH SIGNIFICANT RISKS.

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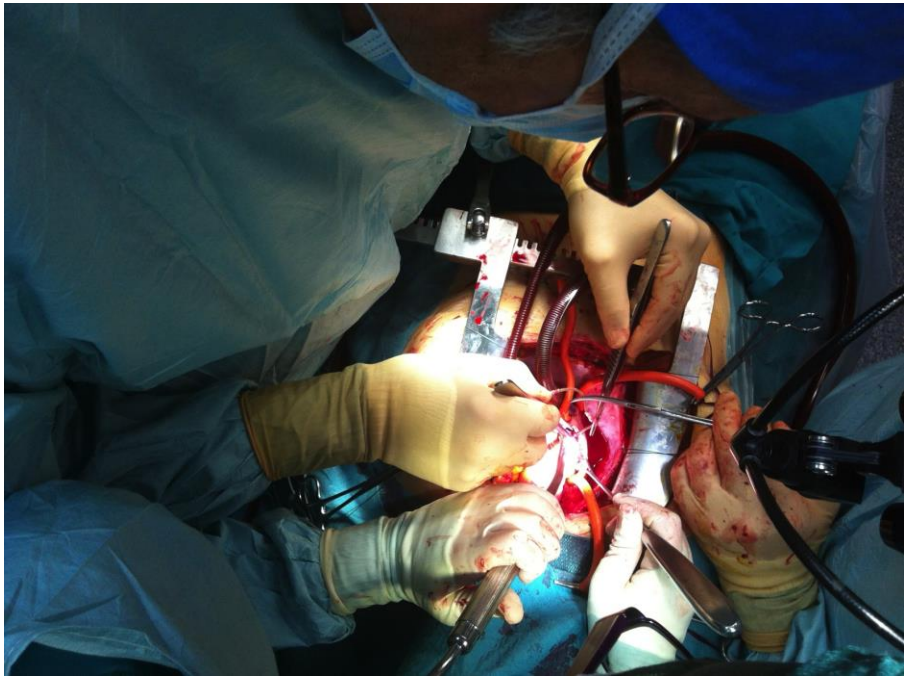
INSUCESSOS DE EXTRACÇÃO

CEC
INTERNAMENTO PROLONGADO
CIRURGIA CARDÍACA EM DOENTE INFECTADO



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TÉCNICA DE PISA

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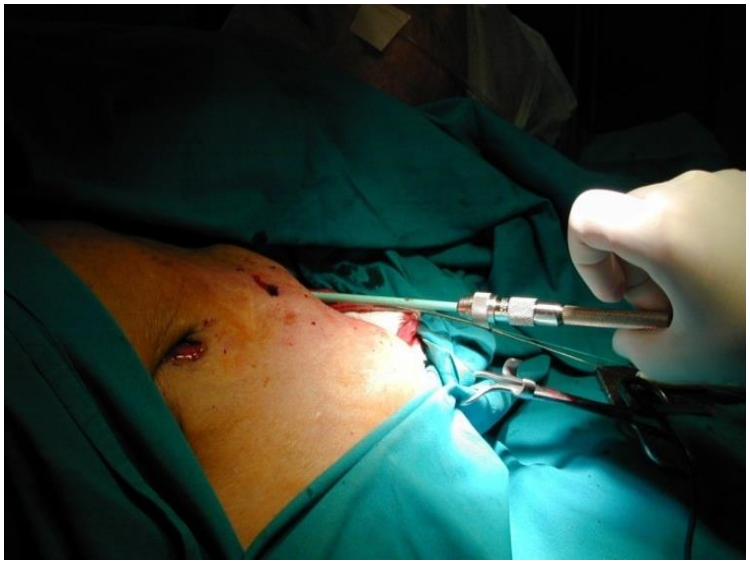

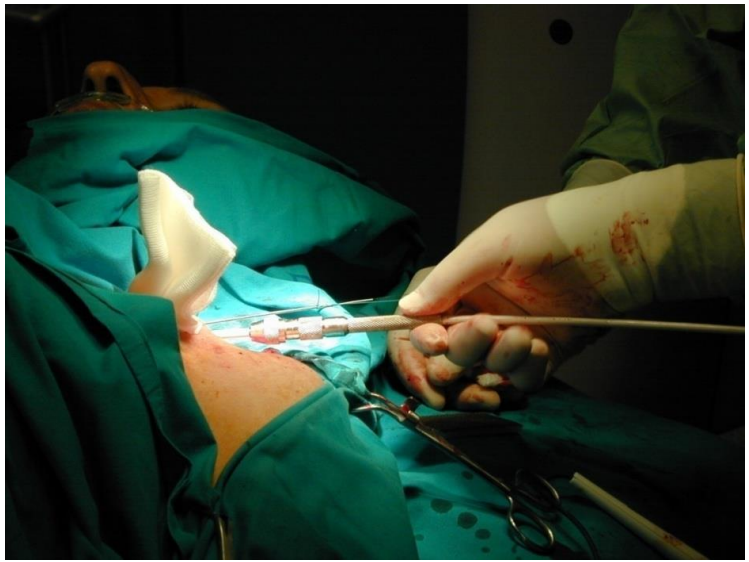

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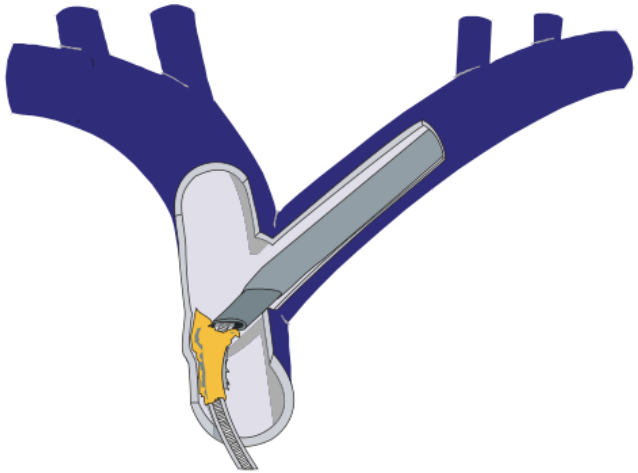
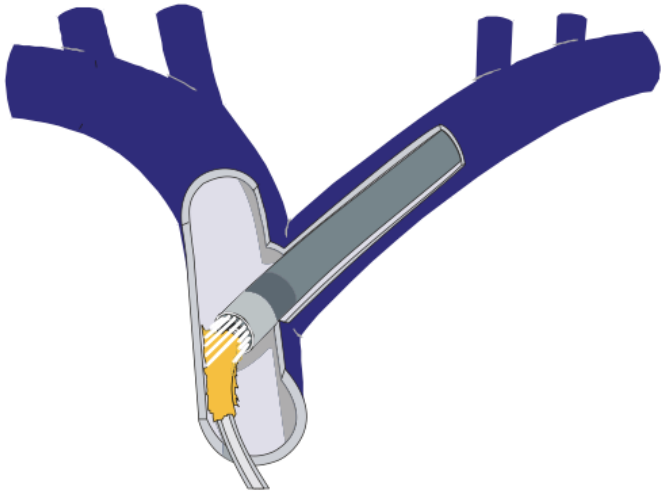
MECHANICAL EXTRACTION SHEATH



POWERED EXTRACTION SHEATH
LASER, RF, THREADED



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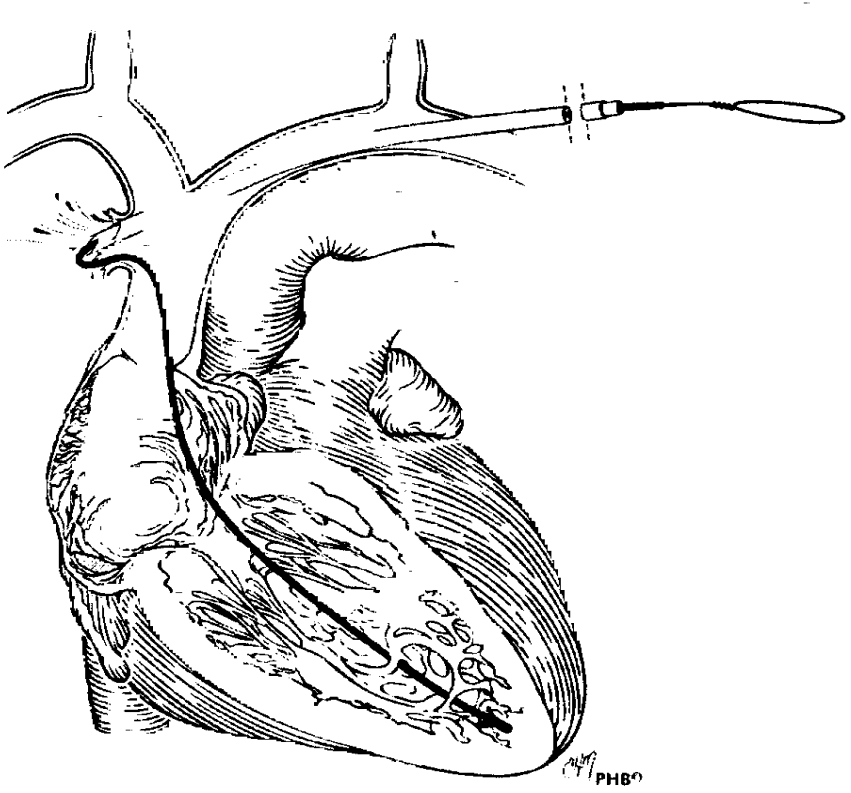
TÉCNICA DE PISA - JUGULAR



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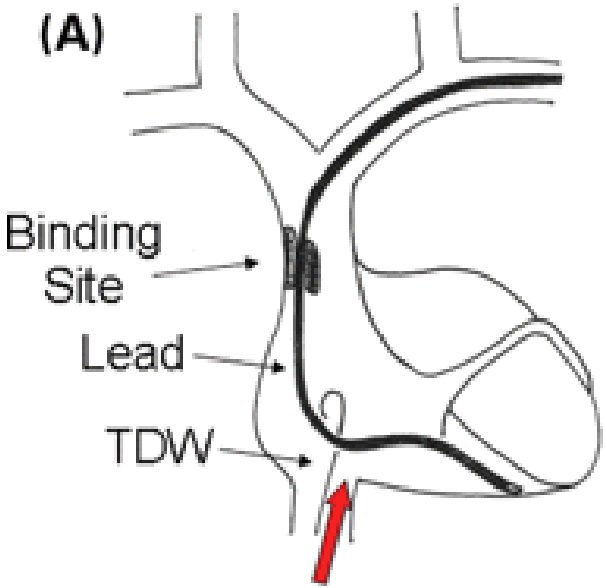
TÉCNICA DE PISA



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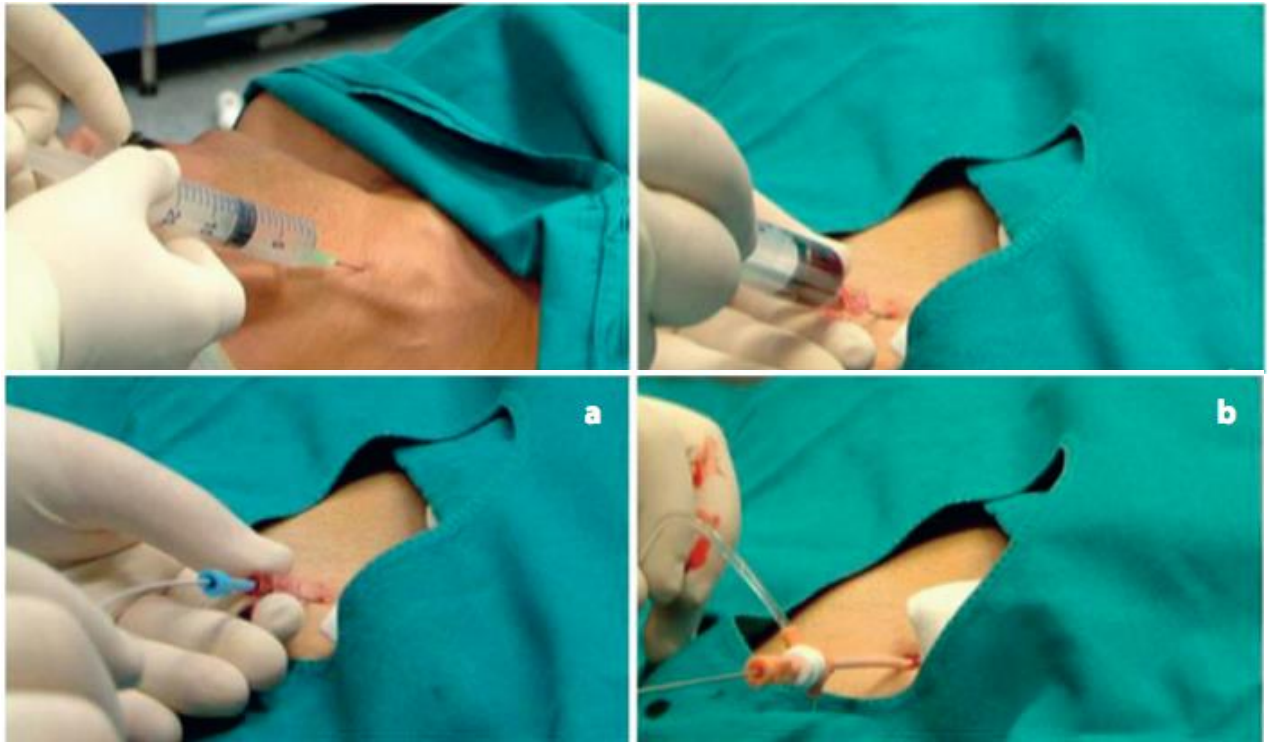
TÉCNICA DE PISA



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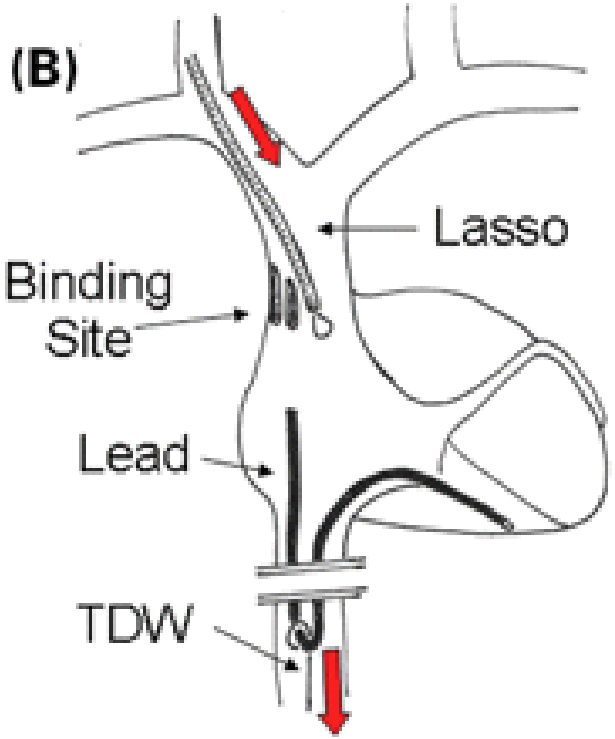

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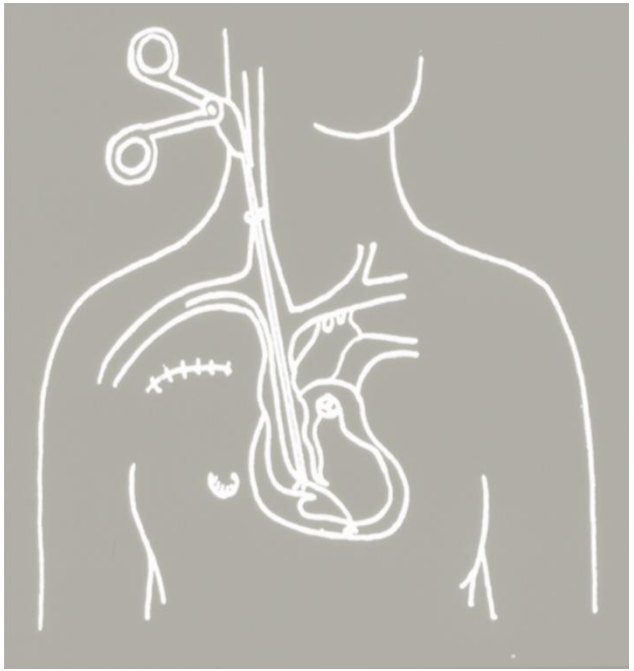

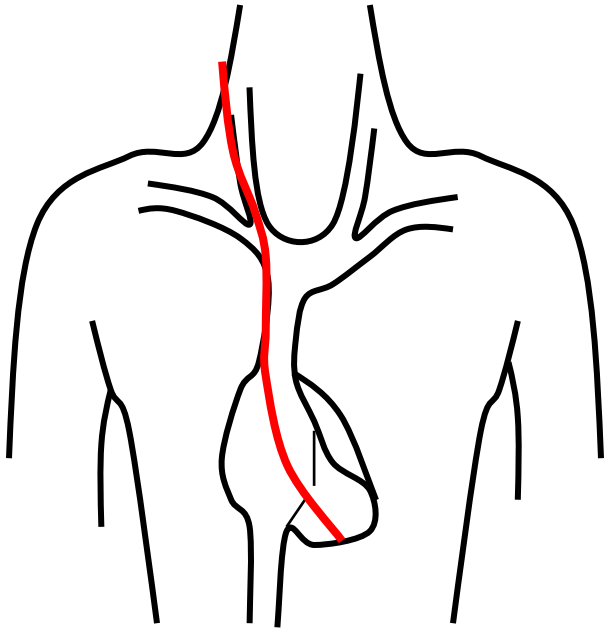

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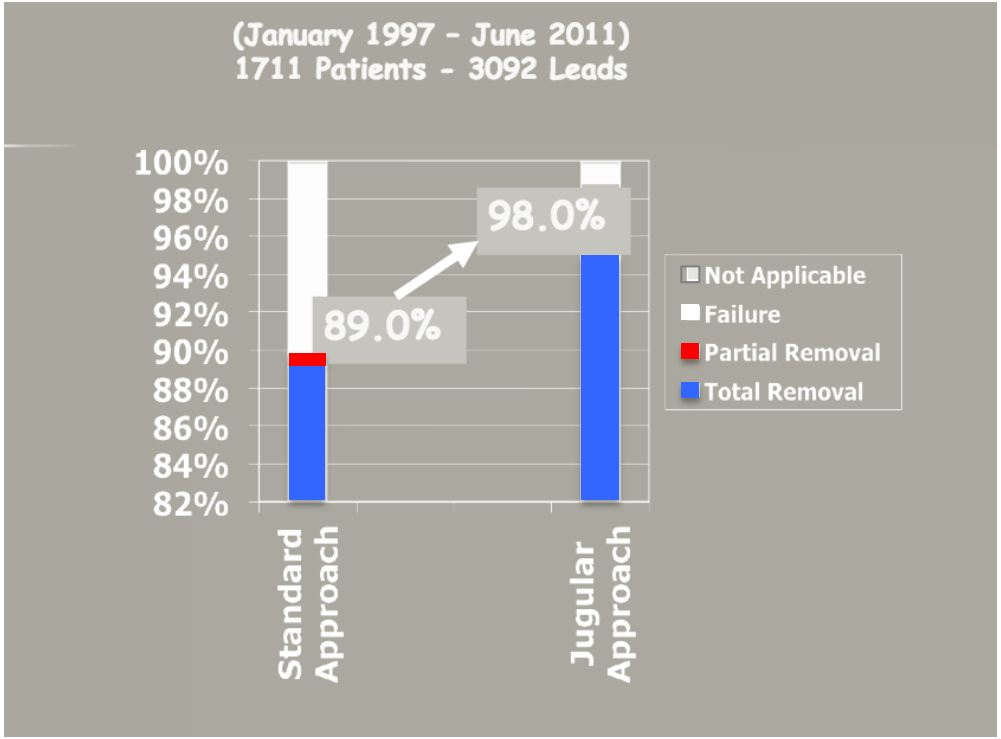
INTERNAL JUGULAR APPROACH



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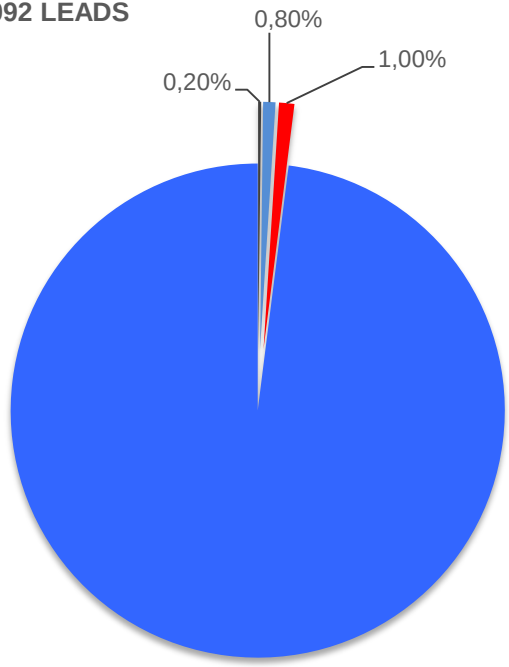
RESULTS

JANUARY 1997-JUNE 2011
1711 PATIENTS – 3092 LEADS



TOTAL REMOVAL 98%

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TÉCNICA DE PISA

MAJOR COMPLICATIONS
10 PTS (O.58%)
JANUARY 1977 – JUNE 2011
1711 PATIENTS – 3092 LEADS

6F / 4M (MEAN AGE 73.4YRS) (RANGE 65-85)

CARDIAC TAMPONADE	9
(FATAL)	2

HEMOTHORAX	1
(FATAL)	1

DEATHS	3 / 1711PTS (0.17%)

NO SVC TEARS

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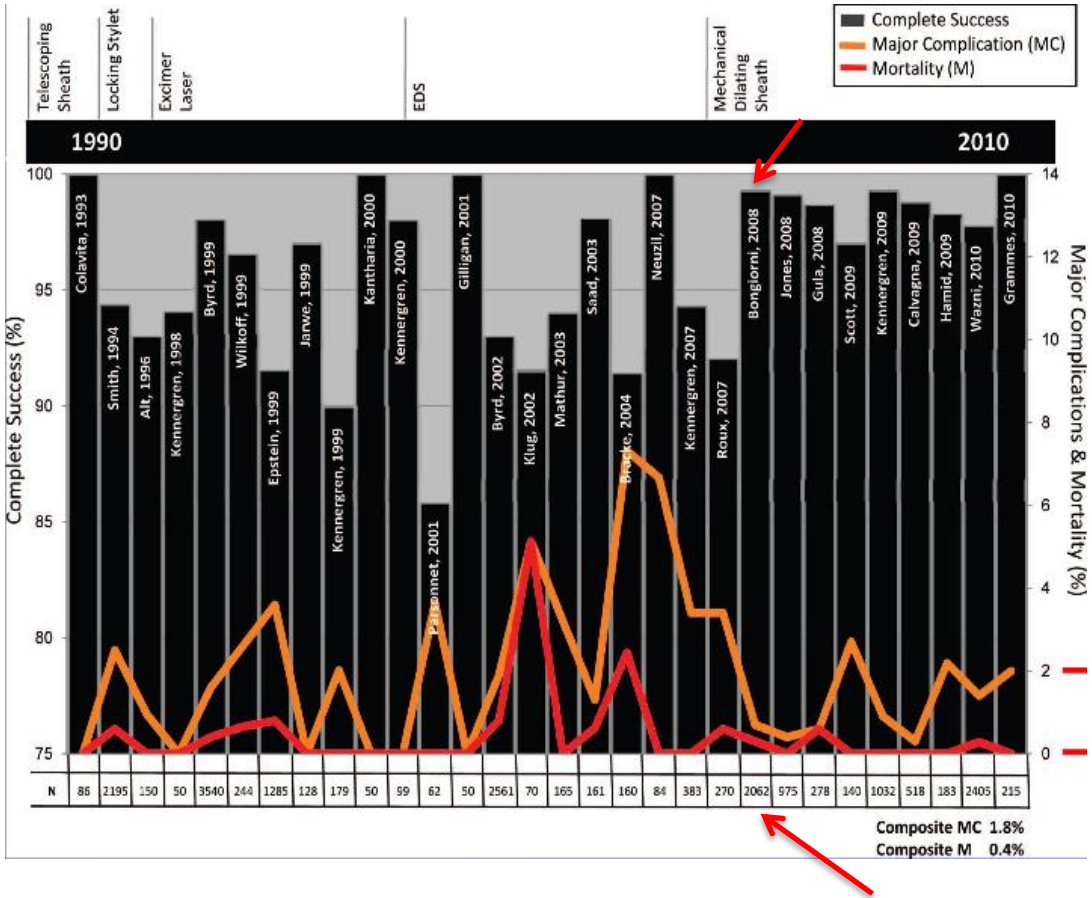

HOSPITAL DE SANTA MARTA

REGISTO ELECTRa

EUR*Observational* Research Programme

Protocol

ELECTRa

(European Lead Extraction ConTRolled)

Registry

September 19th, 2012

Study promoted by the European Society of Cardiology

Executive Committee:

Maria Grazia Bongiorni, Chair

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FIM

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