



SURGICAL ABLATION OF ATRIAL FIBRILLATION

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CONCEPT

To eradicate AF by eradicating reciprocating or circular electrical current in atrium

"MAZE" : narrow corridor through which electrical wave of depolarization must pass

Identifying focus of AF was initial challenge

HISTORY

Successful surgical technique first developed mid 80s by Dr James Cox et al

Problem: results difficult to duplicate

Technically challenging

Several different revisions to address challenges

Different energy sources

CURRENT

Multiple procedures are in use

Pulmonary vein isolation: critical that full thickness lesions are made to isolate pulmonary veins

Left atrial lesions: box lesion

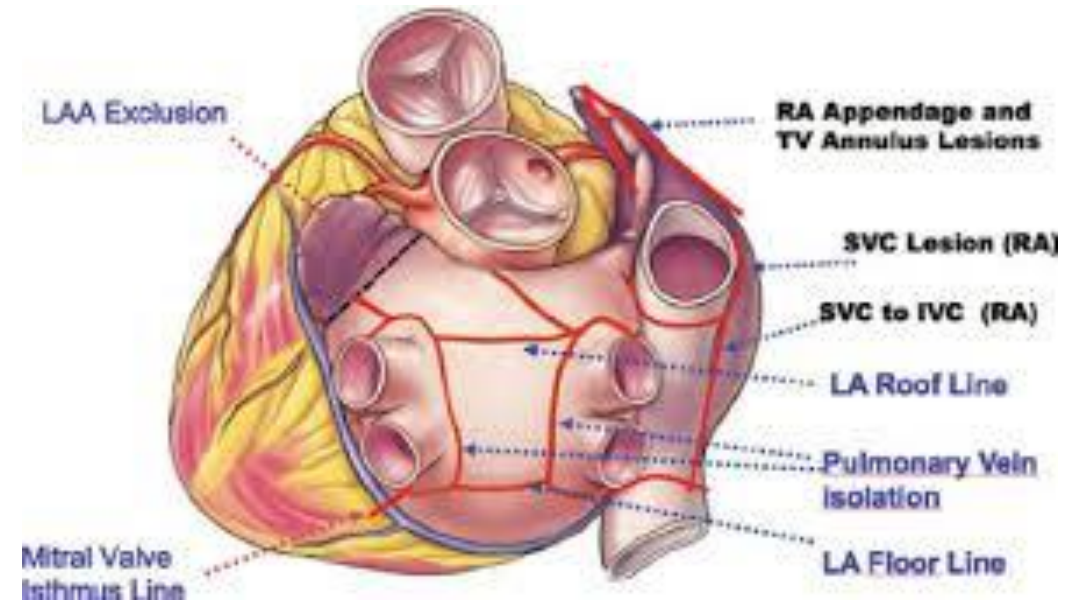
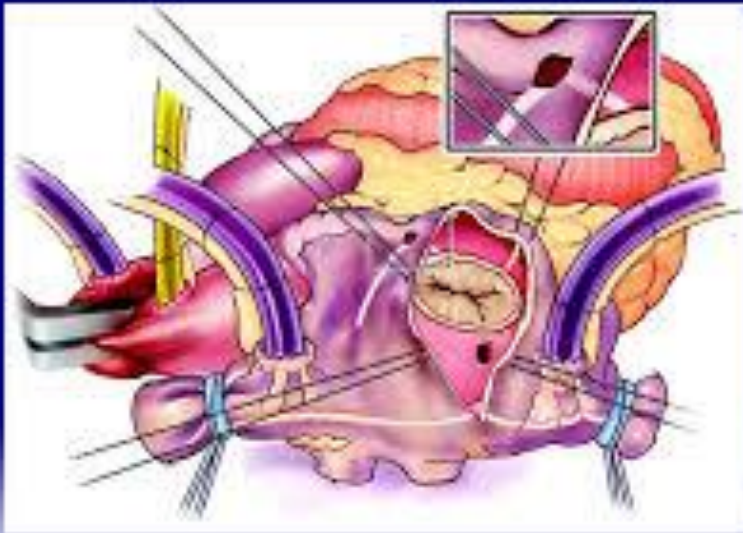
Left atrial lesions: mitral line

Right atrial lesions: necessary in longer established AF

Right atrial lesions: coronary sinus is weak point

COX MAZE IV

Right atrial lesion set of the Cox Maze IV



ENERGY SOURCES

Radio – frequency electrical current irrigated vs non-irrigated

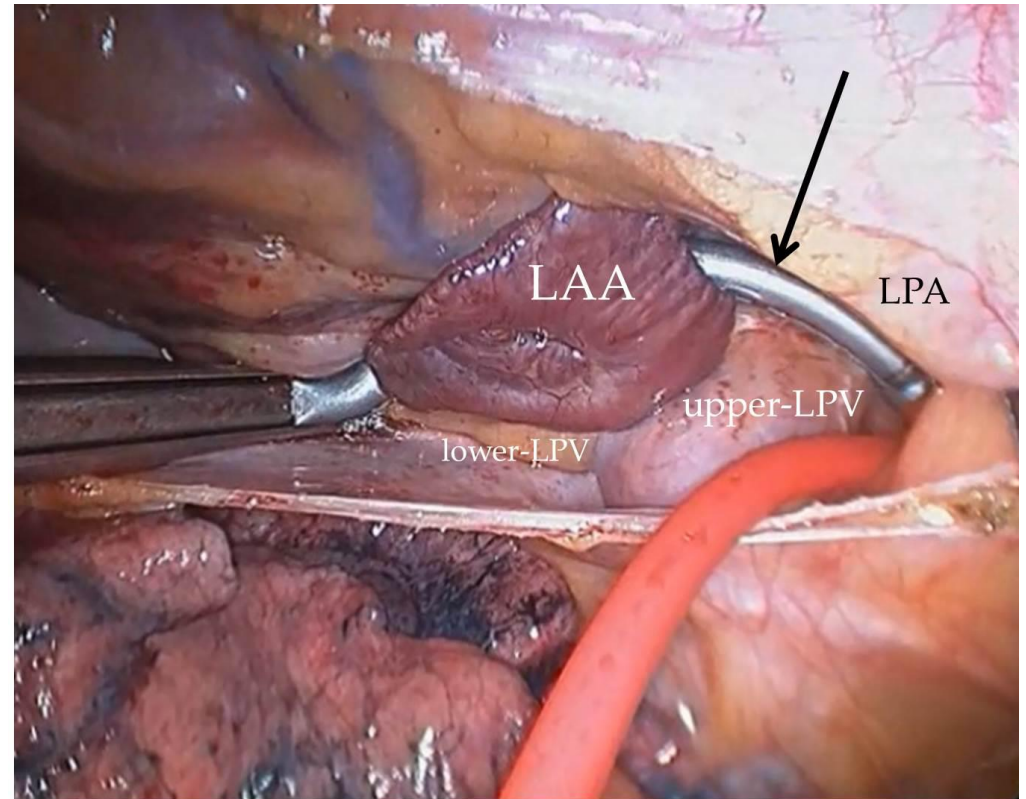
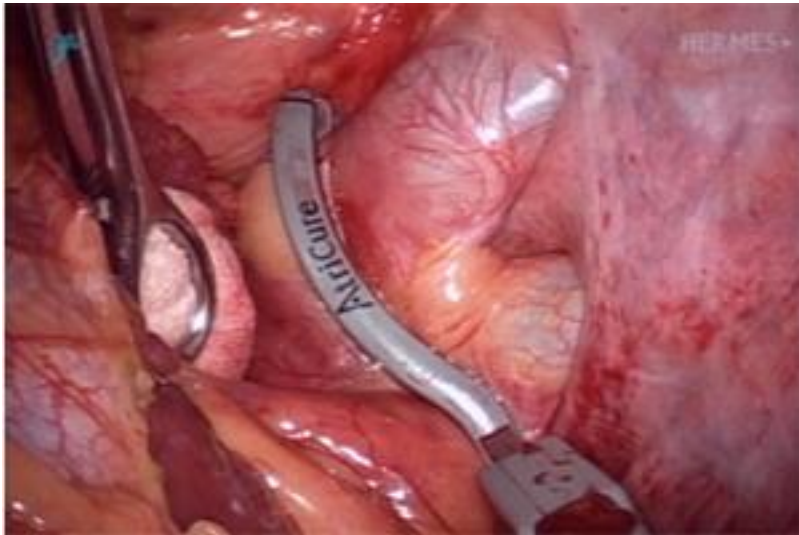
Cryo

High intensity focused ultrasound

Laser

Microwave

CRYOTHERAPY

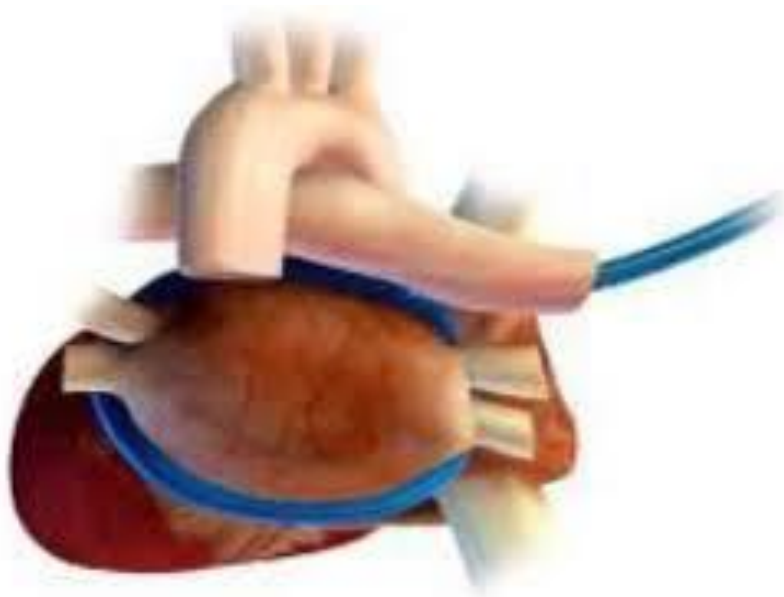


Thoracoscopic view of en bloc LPVs and LAA Isolation:
LAA = left atrial appendage; LPV, A = left pulmonary vein, artery; ↓ = Clamp Isolator

RADIO FREQUENCY



HIGH INTENSITY FOCUSED ULTRASOUND



(a)

(b)

(c)

CURRENT PROBLEMS

Few referrals for isolated AF surgery i.e. most are concomitant procedures

Results of a particular technique are difficult to establish

Key determinants of success are

Duration of AF

Effectiveness of pulmonary vein isolation

Presence of structural change in atrial wall

How careful is follow up