Chronic Total Occlusion of the Coronary Artery

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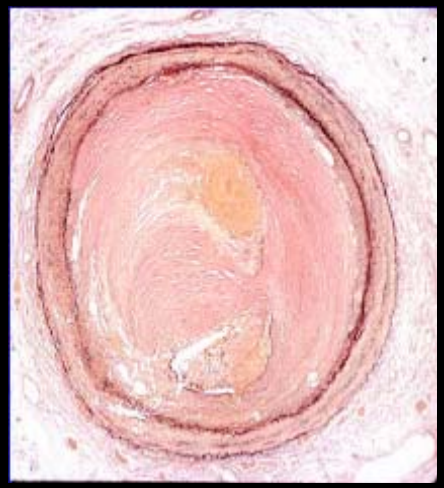
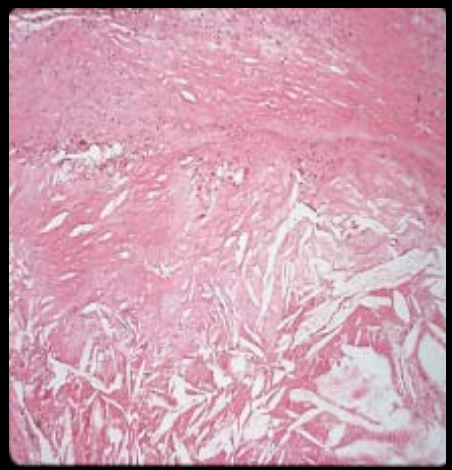
What is a Chronic Total Occlusion?

- A complete blockage of a coronary artery
  - Typically described as ≥99% stenosed
- Duration >3 months
- Responsible for clinically significant decrease in blood flow (TIMI 0-1)

Chronic Total Occlusion

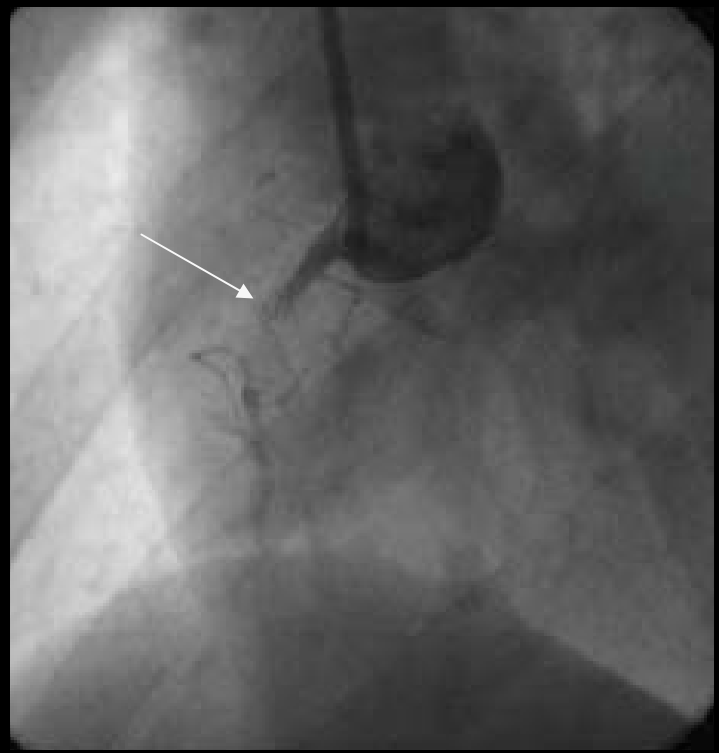


- Hard Plaque
  - Fibrocalcific
  - >50% Collagen/Ca^{++}



- Soft Plaque
  - >50% Cholesterol
  - Macrophages
  - Loose Fibrous Tissue

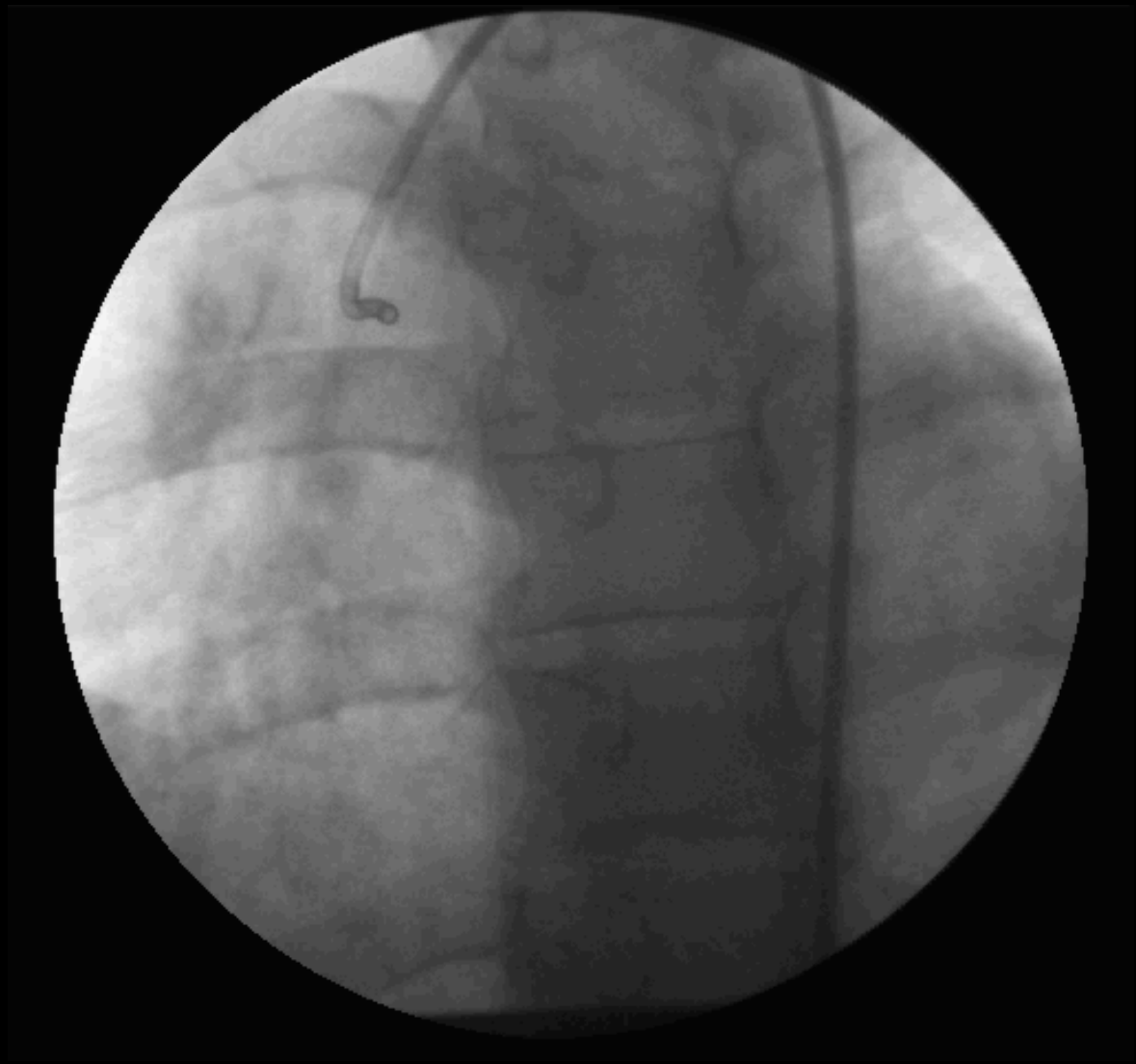
CTO vs. non-CTO



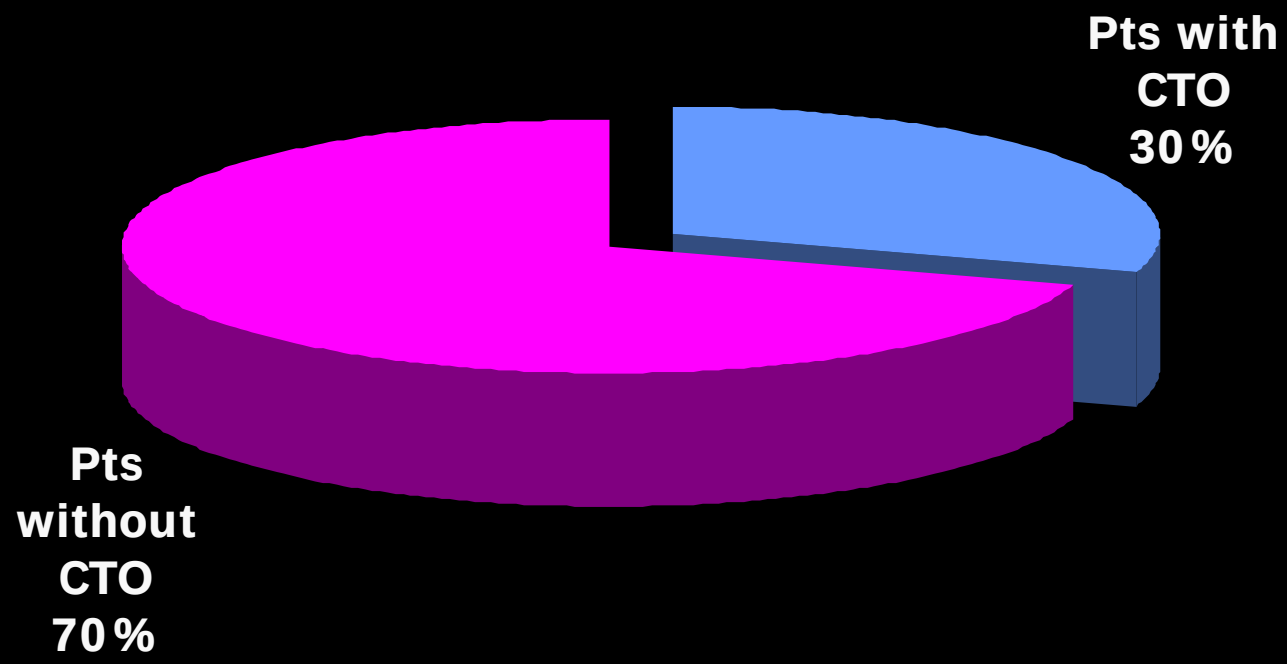
CTO lesion

Non - CTO lesion

CTO Procedure

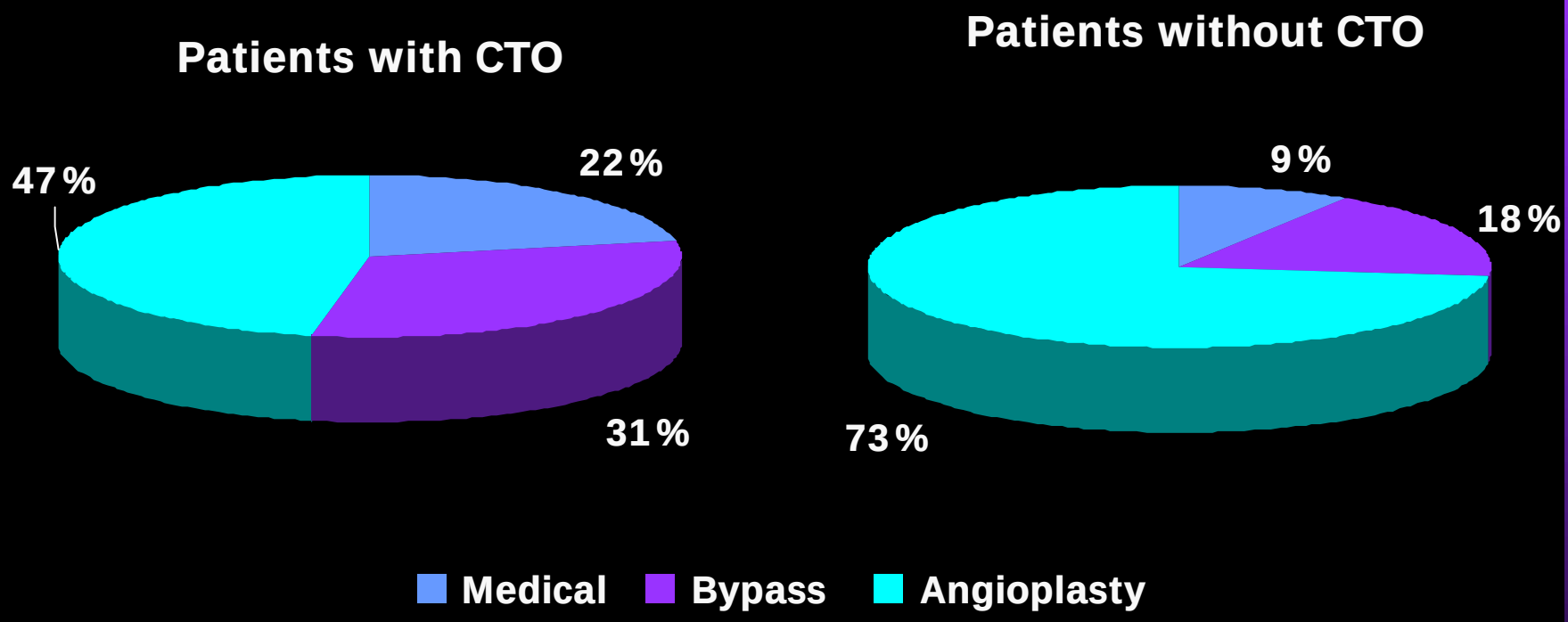


Prevalence of Chronic Total Occlusions in Patients with Coronary Artery Disease



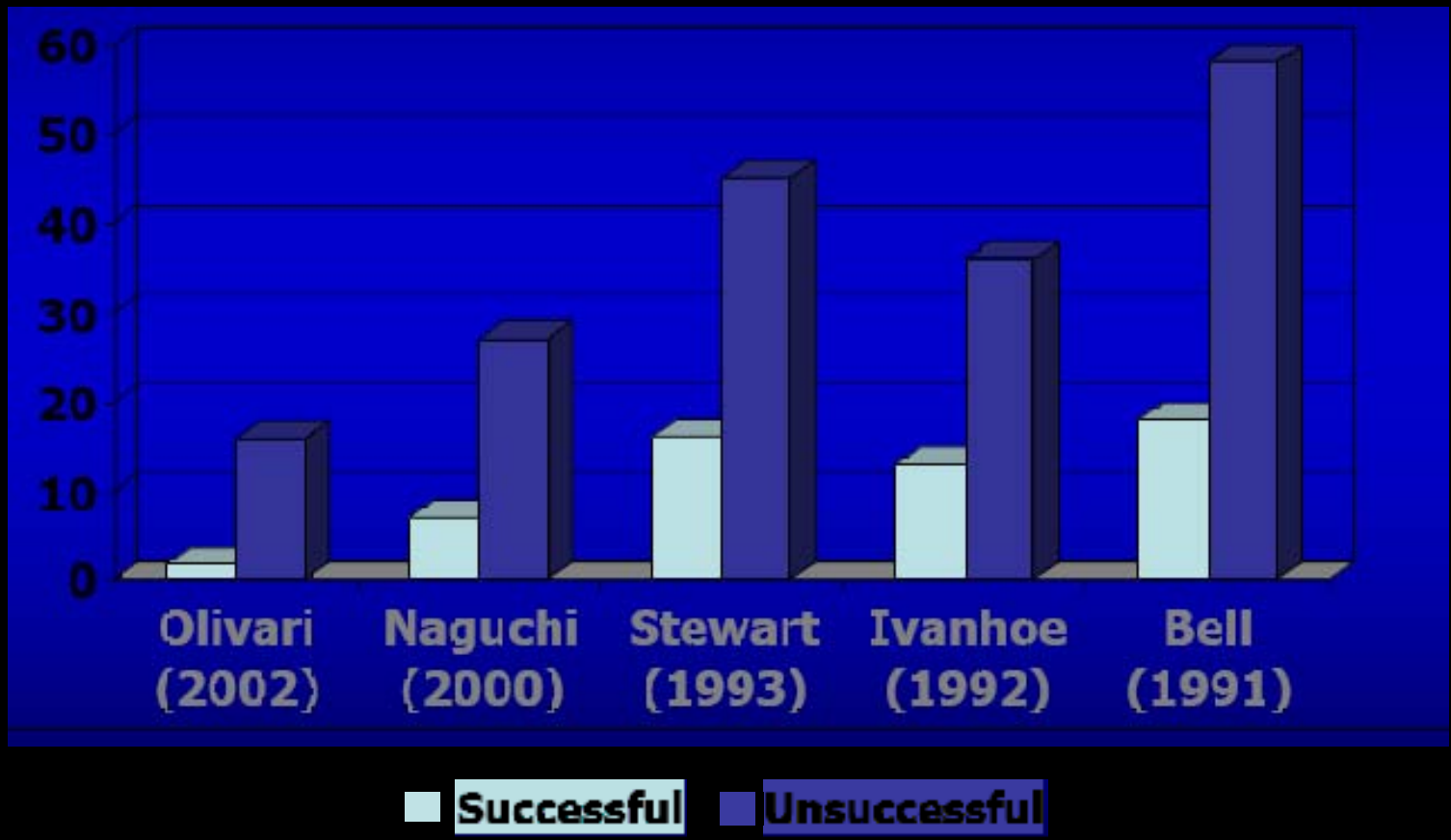
Cardiac Data Sources, BLG Group

Treatment Options



Delacretaz et al, 1997

Percutaneous CTO Treatment Reduces the Need For CABG 50% - 75%



Percutaneous Treatment of CTOs

- Success rates of recanalizing CTOs: 47%–72%
  - Requires greater skill, longer case time
  - Technology development has not increased success rates
- Serious complication rates similar to non-CTO
- All complications rate: 6.8% to 20%
- More resource intensive (greater radiation and fluoroscopy exposure, increased device utilization, increased cath lab time, etc.)

Bell MR, Et al: Circularion 1992: 85:1003-1011
Plante S, Et. Al: Am Heart J 1991; 121:417
Ruocco NA, Et al: Am J Cardiol 1992; 69:69-76
Safian RD, Et al: Am J Cardiol 1988; 61:23G-28G

Chronic Total Occlusion

- "Most frequently identified yet least likely to be treated lesion subset in interventional cardiology today." [1]

- "I have heard of hospitals... that do not want cardiologists taking on CTOs because they tie up the cath lab." [2]

[1] Kandzari DE, Evidence-based rationale for CTO revascularization. TCT 2005, Washington DC

[2] Rutherford B. heartwire November 4, 2005, theheart.org

PCI Complexity Index by Multivariate Analysis

Variable	Score
No of complex lesions	1.0
Bifurcation stenting	1.5
Ostial stenting	0.8
CTO > 3 months	2.8
Severe Tortuosity	4.9
Complexity Index	Σ

Bernardi et al, CCI 2000, 51:1-9

CTO Summary

- Common disorder with inconsistent, non-uniform treatment patterns
- Associated with high resource consumption
- Increased restenosis risk
- Failure to treat associated with worse early and late patient outcomes

Tracking CTO Therapies

- Although documentation exists, limited ability to track CTO procedural volume means:
  - Cannot accurately ascertain number of treated and untreated CTOs
  - Difficult to measure effect on CABG utilization rates
  - Difficult to optimize management strategies in MVD
  - Difficult to track outcomes across different treatment modalities
- Improved data capture can be used to track treatment outcomes and improve quality of care

How are CTOs documented?

- Medical terminology: CTO common term used by Cardiologists
- Physicians will specify the lesion as a ‘chronic total occlusion’ of the coronary artery
- Documentation of ‘chronic total occlusion’ may be found on:
  - Coronary angiography reports
  - Interventional cardiology reports
  - Operative reports
  - History and physical and progress notes

The Intent

- More physicians will have data on the importance in treating CTOs
- More understanding and data will exist on the clinical outcomes of various treatment options
- Improve treatment strategies to optimize quality of life

Any Questions?