ESSENTIAL DEFINITIONS FOR STRICTURE DIAGNOSIS & THERAPY

**STENOSIS**: Narrowing or stricture of duct or canal

**STRUCTURE**: Decrease in the caliber of a canal, duct or other passage as a result of fibrotic contraction or the deposition of abnormal tissue

DORLAND’S MEDICAL DICTIONARY
STENOSIS

Spasm
Inflammation
Fibrosis
Cancer
Compression

STRUCTURE
ADVANTAGES OF STRICTURE CLASSIFICATION

REQUIRES COMPLETE HISTORICAL AND ANATOMICAL INFORMATION

ASSISTS WITH THERAPEUTIC PLAN:
- SELECTION OF DILATORS
- SEQUENCE OF DILATION
- FREQUENCY / INTERVAL FOR DILATION
- DETERMINATION OF PROGNOSIS
CLINICAL CRITERIA FOR COMPLEX STRICTURES

- ETIOLOGY – PREDICTED PATHOLOGY
- LUMEN DIAMETER – USUALLY < 1 CM
- LENGTH – USUALLY > 2 CM
  - EXCEPTION – ANASTOMOTIC
- LUMEN - STRICTURE AXIS DEVIATION
- LONG HISTORY, INADEQUATE DILATION
- MALIGNANCY
ANATOMIC- HISTOLOGIC ESOPHAGEAL STRicture CLASSIFICATION

MUCOSAL – SUBMUCOSAL INJURY – FIBROSIS

TRANSmURAL INJURY – FIBROSIS

POST SURGERY – ANASTOMOMATIC OR OCCLUSIVE (ANTIREFLUX or BARIATRIC)

MALIGNANCY
TRANSWMURAL ESOPHAGEAL INJURY AND FIBROSIS

◆ RADIATION THERAPY

◆ CAUSTIC / CHEMICAL / THERMAL
  ACID REFLUX - N/G TUBE, HYPEREMESIS

◆ PILL – INDUCED
  • QUINIDINE GLUCONATE
  • POTASSIUM CHLORIDE
TRANSMURAL ESOPHAGEAL INJURY AND FIBROSIS

- ESOPHAGEAL ISCHEMIA
- POST SURGICAL
  - ANASTOMOTIC, BARIATRIC, NISSEN
- EMR, PDT / YAG LASER Rx
Radiation Stricture

6 mm diameter
Caustic (lye) Stricture

Above Stricture

Below Stricture -- Pseudodiverticula
NATURAL HISTORY OF COMPLEX STRICTURES

DEEP OR TRANSMURAL INJURY

ACUTE / CHRONIC INFLAMMATION (12-24 months)

POOR RESPONSE TO DILATION

MATURATION OF CICATRIX

IMPROVED RESPONSE TO DILATION

CONTINUED DILATION IMPERATIVE AT WIDER INTERVALS

DYSPHAGIA RELIEF
GOALS OF ESOPHAGEAL DILATION

ESTABLISH AND MAINTAIN A PATENT ESOPHAGEAL LUMEN COMPATIBLE WITH THE PATIENT’S DIETARY PREFERENCE AND LIFESTYLE AT THE LOWEST RISK AND COST IN TIME AND MONEY
PLANNING DILATION THERAPY

◆ RECENT BARIUM ESOPHAGRAM

◆ TYPE OF DILATOR(S) TO USE

◆ DILATOR SIZE FOR OPTIMUM RELIEF
  • NEED, COMFORT, RISK

◆ NUMBER DILATORS / SESSION
“RULE of 3”
1975

- A clinical guideline only
- Dilator #1 = first dilator with moderate resistance
- Dilators #2 and 3 – moderate or greater resistance – STOP after # 3
  - operator judgement after # 2
- Does not apply with TTS balloons
- DO NOT USE for Strictures related to Eosinophilic Esophagitis
<table>
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<tr>
<th>DIAMETER</th>
<th>CONSISTENCY</th>
<th>DIET</th>
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<tr>
<td>7 mm</td>
<td>21 Fr</td>
<td>LIQUID, PUREED</td>
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<tr>
<td>10</td>
<td>30 Fr</td>
<td>PUREED, SOFT</td>
</tr>
<tr>
<td>13</td>
<td>39 Fr</td>
<td>SOFT</td>
</tr>
<tr>
<td>15</td>
<td>45 Fr</td>
<td>REGULAR – MODIFIED</td>
</tr>
<tr>
<td>18</td>
<td>54 Fr</td>
<td>REGULAR WITH CARE</td>
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</table>
ESOPHAGEAL WALL THICKNESS

18.5 mm

4 mm
COMPLEX ESOPHAGEAL STRICTURES

~DILATION THERAPY ~

WIRE – GUIDED SAVARY

- LATER MALONEY ( > 42 Fr)
- TTS – LESS DILATION, ? RISK

FLUOROSCOPY – SAFEST (Boyce bias)

SEQUENCE – “RULE OF 3”

INTERVAL – VARIABLE
POST DILATION PHOTOGRAPHIC ARTIFACT

TTS “PSEUDODILATION”
ESOPHAGEAL STRICTURE
BOUGIE DILATION TECHNIQUE

- DILATOR SELECTION – SAVARY PREFERRED FOR COMPLEX STRICTURES

- UNDERSTAND GUIDE WIRE DESIGN AND IMPORTANCE OF TIP PLACEMENT STABILITY

- IF FLUOROSCOPY AVAILABLE – USE IT!

  FOR COMPLEX STRICTURES – PLAN TO USE IT!!

- LUBRICATE ONLY 8 to 10 cm OF DILATOR TIP
PROPER HEAD POSITION FOR PERORAL DILATION

- REDUCES PRESSURE ON POSTERIOR PHARYNGEAL WALL

- REDUCES TISSUE INJURY (RISK OF PERFORATION?)

- REDUCES POST-DILATION SORE THROAT

- IMPROVES TACTILE DETECTION OF STRicture RESISTANCE (especially with bite block removed)
HEAD – NECK POSITION FOR DILATION
N-G TUBE – GER - RELATED STRICTURE

◆ 2 DAYS – WEEKS INTUBATION

◆ LES STENTED → REFLUX
  • PROLONGED ACID CLEARANCE

◆ DYSPHAGIA / ODYNOPHAGIA WITH 1ST SOLID FOOD
N/G Tube – Reflux Stenosis Evolution To Stricture

Initial Endoscopy
STENOSIS

12 Months Later
STRicture
QUINIDINE GLUCONATE STRICTURE

<<< 2 mm stricture
QUINIDINE GLUCONATE (QUINIGLUTE) STRicture
POST-DILATION FRIGHT – BUT ESSENTIAL!!
MY MOST INTERESTING STRicture AFTER PRESTERNAL ESOPHAGO-GASTROSTOMY BY HENRY HEIMLICH IN 1975
ANASTOMOTIC STRicture
Pre-sternal Esophago - gastric

Dilator Size (mm)

0 2 4 6 8 10 12 14 16 18

Maloney Dilator
Resistance

LW 55 wf
BENIGN ESOPHAGEAL STRICTURES
STEROID INJECTION OUTCOMES

- PERFORMED FOR OVER 50 YEARS - ? BENEFIT

- NO STUDY DONE TO CONFIRM INCREASE IN LUMEN DIAMETER FOR FIBROTIC STRICTURES BY OBJECTIVE TESTING

- RESULTS BASED ON SYMPTOM IMPROVEMENT AND REDUCED DILATION FREQUENCY—PROBABLY INFLAMMATORY STENOSES

- NO PROOF OR CONSENSUS OF LASTING BENEFIT EXCEPT FOR PEPTIC STRICTURES WHICH NEARLY ALWAYS RESPOND WELL WITH ADEQUATE DILATION AND PPI THERAPY
Benign Strictures
\[ n = (1013) \]

- Simple: 436 (43%)
- Complex: 577 (57%)

CSD 1987 – 2007
## USF SWALLOWING CENTER SERIES (1987 – 2007)

**TECHNIQUE: RULE OF 3 + FLUOROSCOPY**

<table>
<thead>
<tr>
<th>Stricture Type</th>
<th>Total n</th>
<th>Perforations n</th>
<th>%</th>
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<td>Benign Strictures</td>
<td>1013</td>
<td>2</td>
<td>0.18</td>
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<tr>
<td>Simple</td>
<td>436</td>
<td>1</td>
<td>0.23</td>
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<tr>
<td>Complex</td>
<td>577</td>
<td>1</td>
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<tr>
<td>Literature Reports</td>
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<td>0.1 – 3.9</td>
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(for all grades of stricture)
RADIATION STRICTURES

There is no evidence that proper dilation during radiation therapy or soon after carries an added risk of perforation or increased morbidity.
APHAGIA
ULTIMATE IATROGENIC OUTCOME

Head / Neck Carcinoma  ----> PEG

↓
Radiation – Chemotherapy -- +/- Surgery

↓
Dysphagia

↓
Failure To Dilate / No Swallow Rx

↓
Complete Pharyngo-Esophageal

↓
OBSTRUCTION
ENDOSCOPIC LUMEN RESTORATION
(n = 30)

TOTAL ORAL NUTRITION 15 (50%)
  Enteral tube out 13 (43%)
  Enteral tube in (100% po intake) 2 (7%)

LIMITED ORAL INTAKE (liquids) 5 (17%)

NPO, lumen patent, unsafe oral feeder due to aspiration risk 10 (33%)

MEDIAN DURATION OF APHAGIA 15.5 mo (range 5 – 109 mo)
A PROGRAM FOR STRICTURE THERAPY

1. EVALUATE – History, Physical Exam, Esophagram, Endoscopy/Biopsy
2. CLASSIFY Stricture Based On Etiology And Objective Tests
3. ESTABLISH DILATION PROGRAM Based On Assessment
   a. Select Dilator(s)
   b. Educate Patient: Technique, Risks, Prognosis
   c. Establish Dilation Program Based On Etiology, Duration Of Stricture, And Dietary Preferences
4. AND REMEMBER……..
OVER THE NEXT DECADE

- GERD STRICTURES WILL DECREASE

- COMPLEX STRICTURES WILL INCREASE DUE TO:
  IATROGENIC CAUSES
  EOSINOPHILIC ESOPHAGITIS
IATROGENIC ESOPHAGEAL STRICTURES
~ CHALLENGES FOR THE FUTURE ~

DIRECT
- RADIATION / CHEMOTHERAPY
- PHOTODYNAMIC THERAPY (PDT)
- SCLEROTHERAPY
- ACID PERFUSION (BERNSTEIN) TEST
- SURGICAL ANASTOMOSIS
- FUNDOPLICATION / BARIATRIC
- ENDOSCOPIC MUCOSAL RESECTION (EMR)

INDIRECT
- NASOGASTRIC INTUBATION (GER)
- PILL ESOPHAGITIS
PLEASE REMEMBER !!

“TRUE STRICTURES DON’T RECUR
(THEY ARE PERMANENT)

BUT

DYSPHAGIA MAY RECUR”
PLEASE REMEMBER !!

“ALL STENOSES ARE NOT STRICTURES”

“ALL STRICTURES ARE NOT CREATED EQUAL”

“DYSPHAGIA IS NEVER PSYCHOGENIC”