Advanced endoscopy in Pediatric Department

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ESOPHAGEAL ATRESIA

- Esophageal atresia (EA) is a complex congenital malformation
- Incidence - 1:4000 live births
- The first successful repair was in 1941, by Dr Cameron Height.
- The survival rate approach 100%.

ESOPHAGEAL ATRESIA

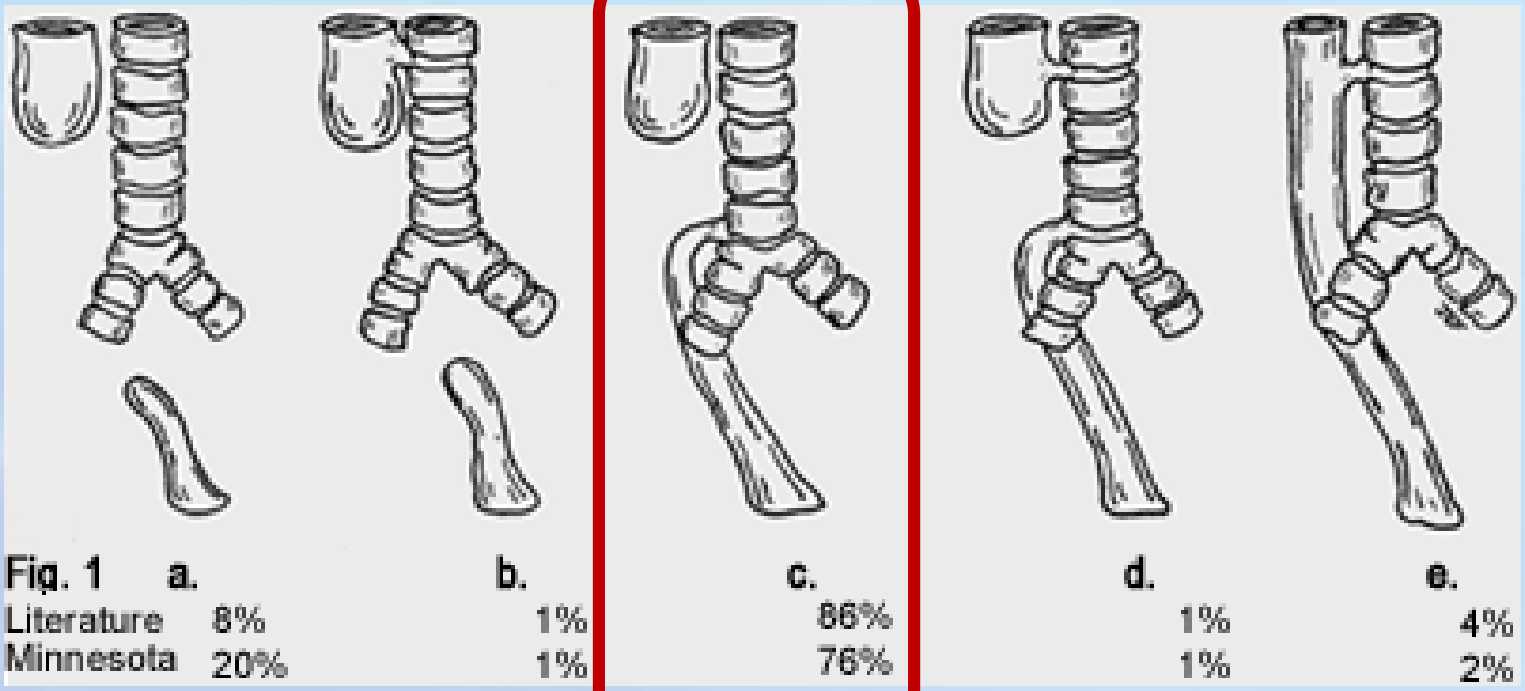
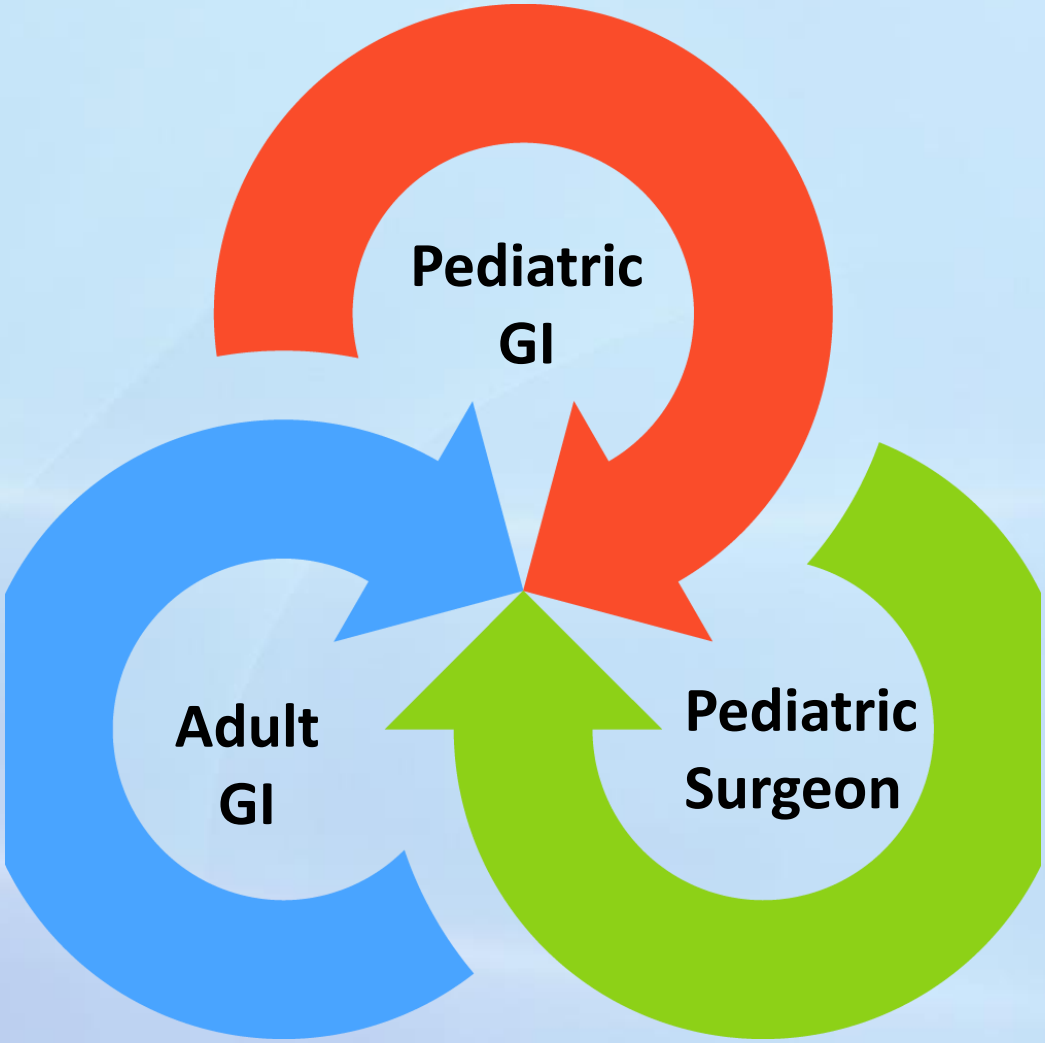


Fig. 1	a.	b.	c.	d.	e.
Literature	8%	1%	86%	1%	4%
Minnesota	20%	1%	76%	1%	2%

Postsurgical esophageal atresia repair morbidities

- Esophageal leak or perforation
- Esophageal stricture
- Anastomosis dehiscence
- Recurrent tracheoesophageal fistula
- Gastroesophageal reflux disease
- Dysphagia
- Esophageal dysmotility
- Aspiration
- Esophagitis
- Barrett esophagus
- Esophageal cancer


Pediatric
GI
Adult
GI
Pediatric
Surgeon

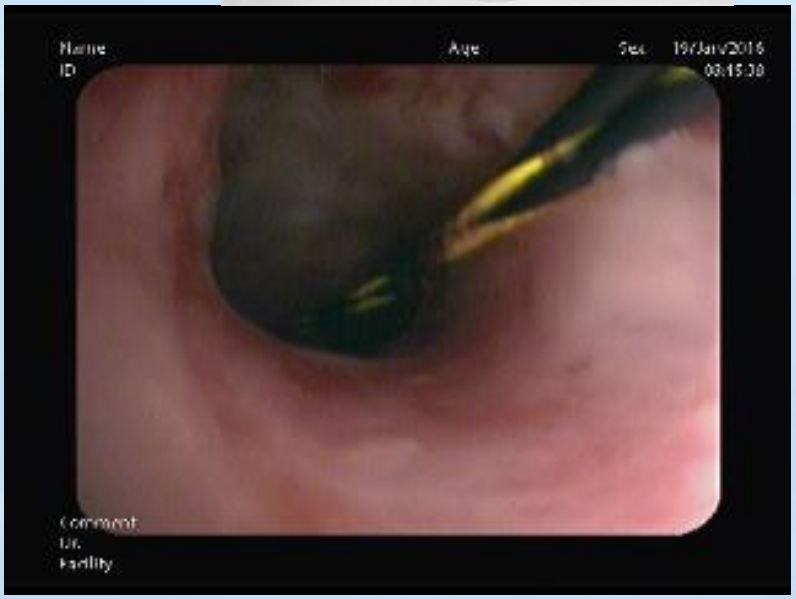
Case 1

- Y.E
- 8 months old female
- Congenital Esophageal atresia –type A
- 1 day – gastrostomy
- Foker procedure – to enclose the esophagus ends
- Severe mediastinitis
- 6 months- end to end anastomosis
- Severe stenosis at the anastomosis
- Recurrent leaking – fistula to lungs

Case 1

Case 1
Esophageal Savary dilations

- 5, 7 mm diameter.

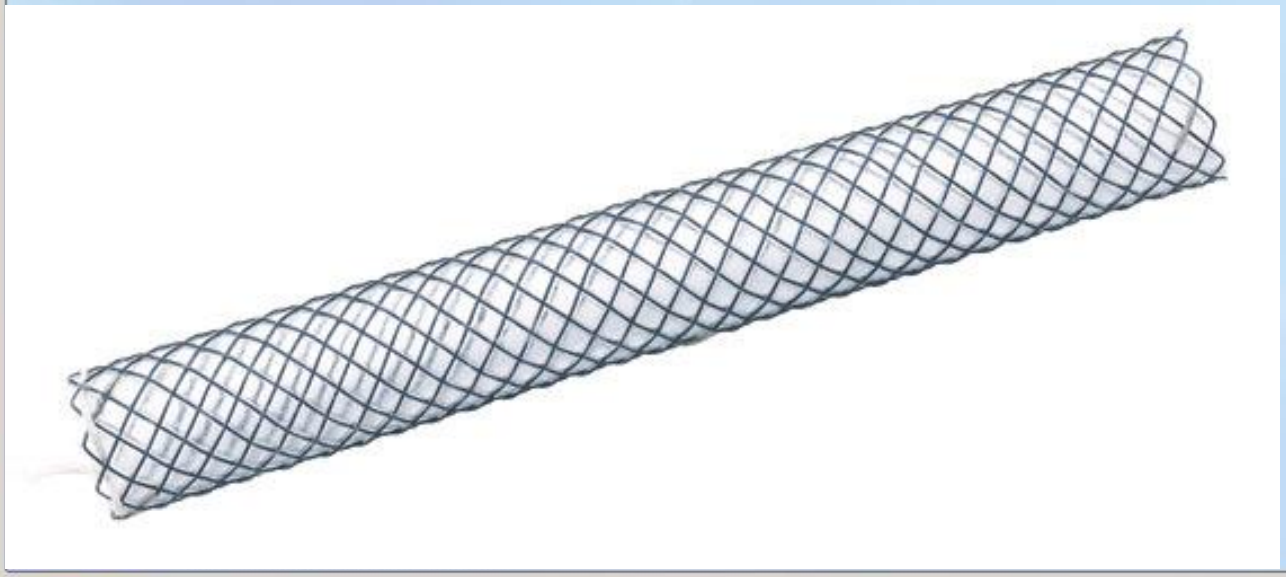


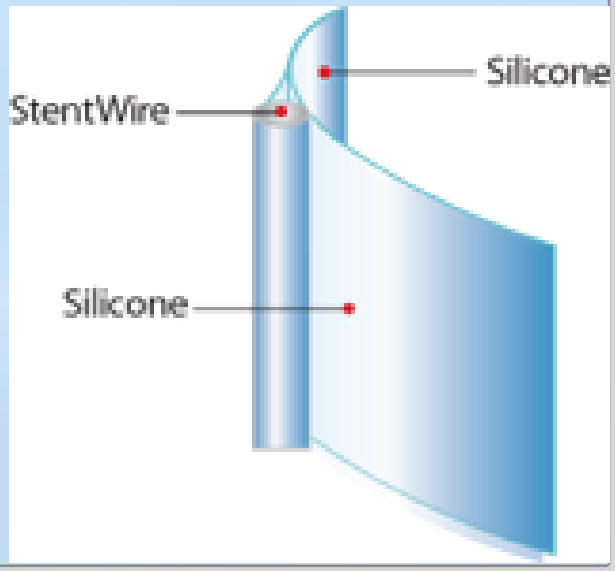
Before

After

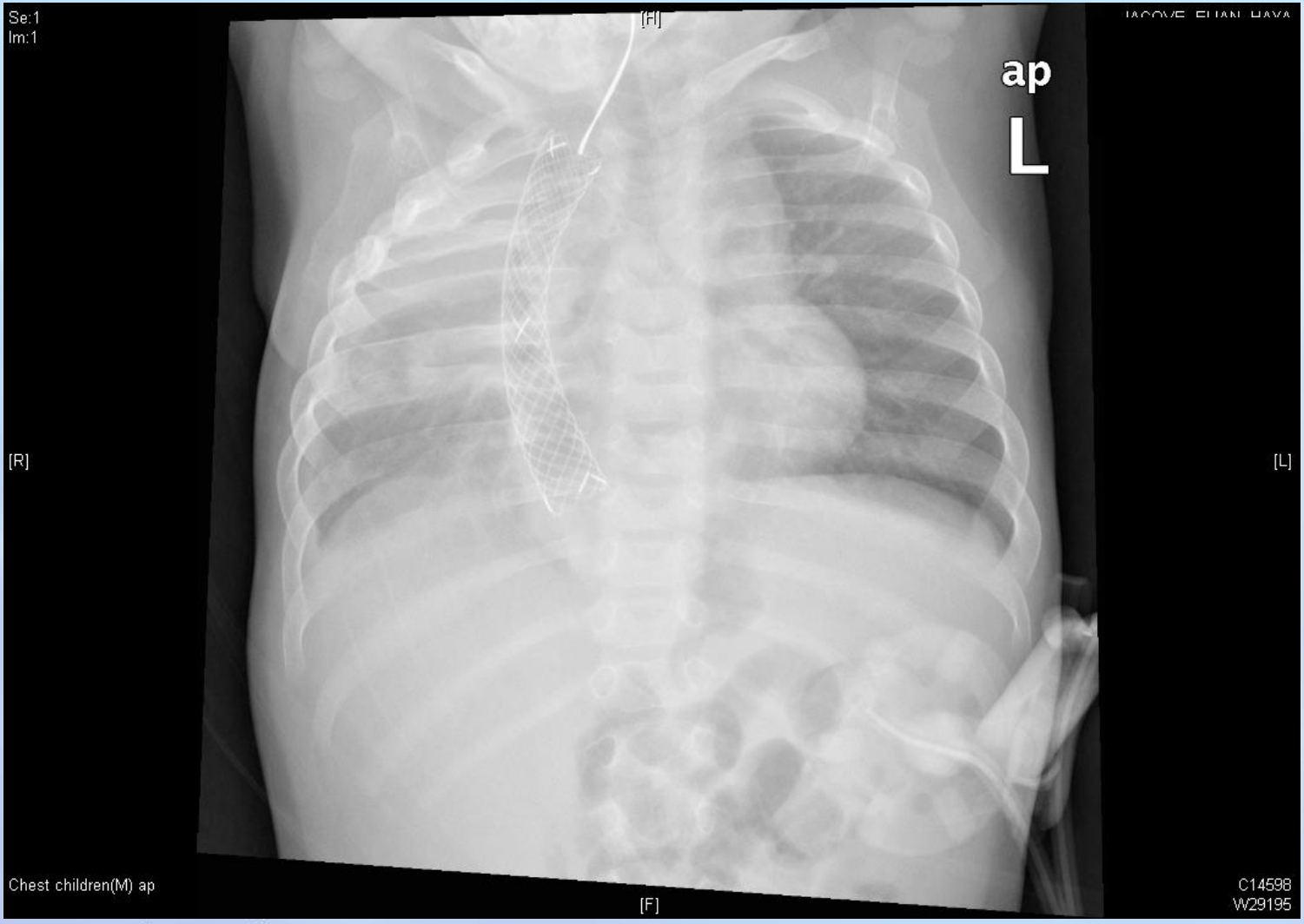
Taewoong Niti-S™ Biliary Stents

- Nickel titanium, also known as nitinol is a metal alloy of nickel and titanium.
- It exhibit two related and unique properties: shape memory effect and superelasticity.

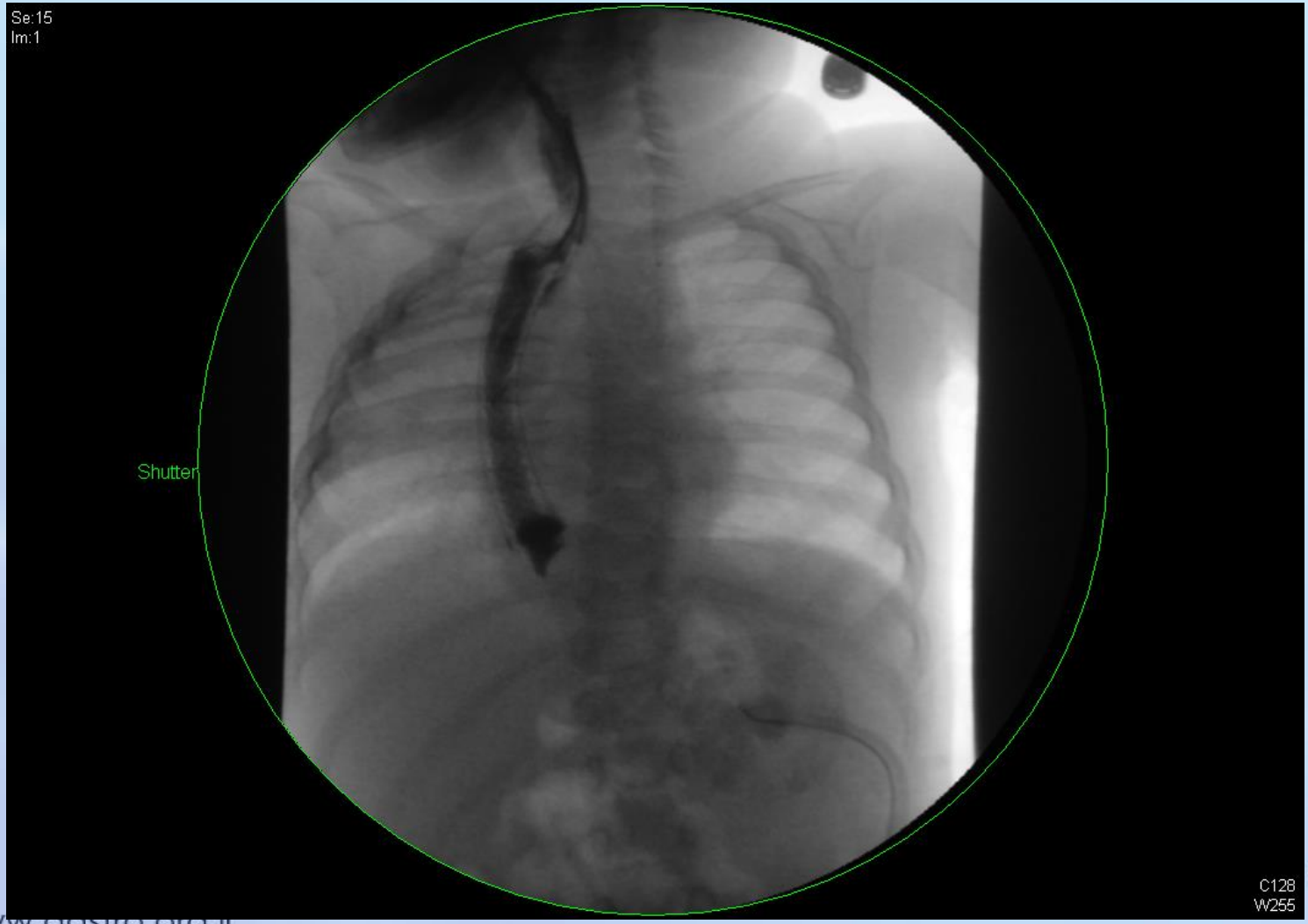




Biliary stent

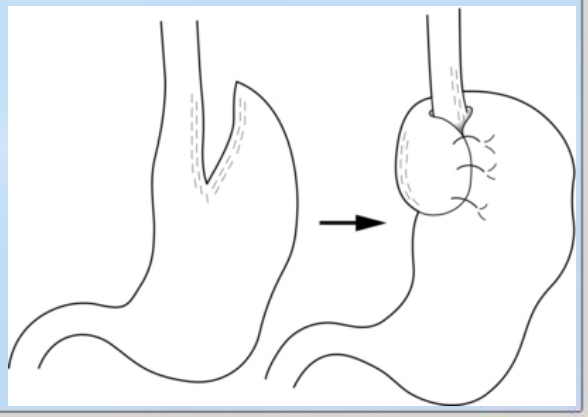


UGI study

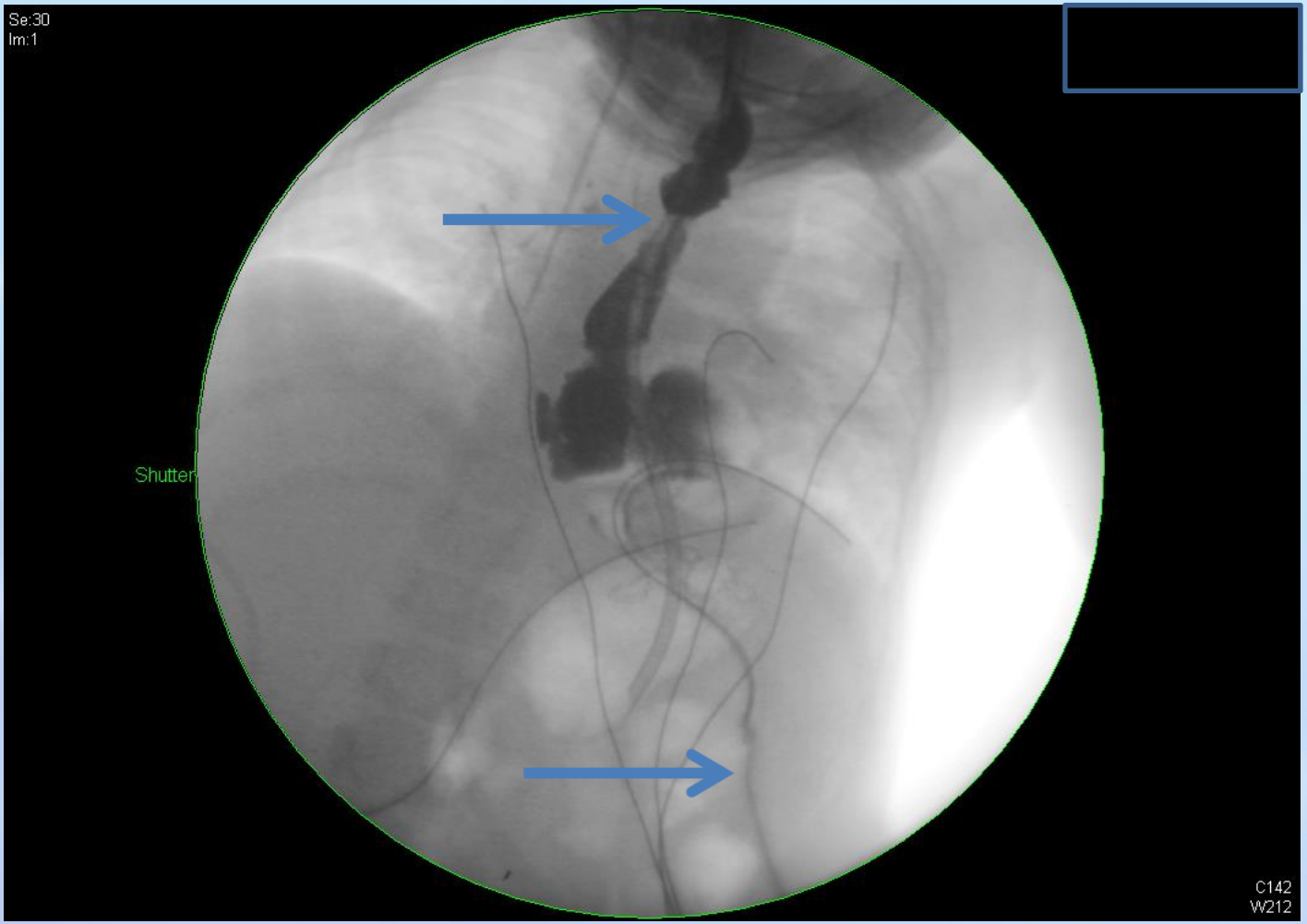


Case 2

- B.R.
- 2 years old female
- Congenital Esophageal atresia –type C
- Surgery - end to end anastomosis
- Leagake, fistula, severe GERD, severe FTT
- Esophageal stenosis ->dilations->perforation
- Feeding jejunostomy
- 1.8 years old – Collis Nissen



Case 2



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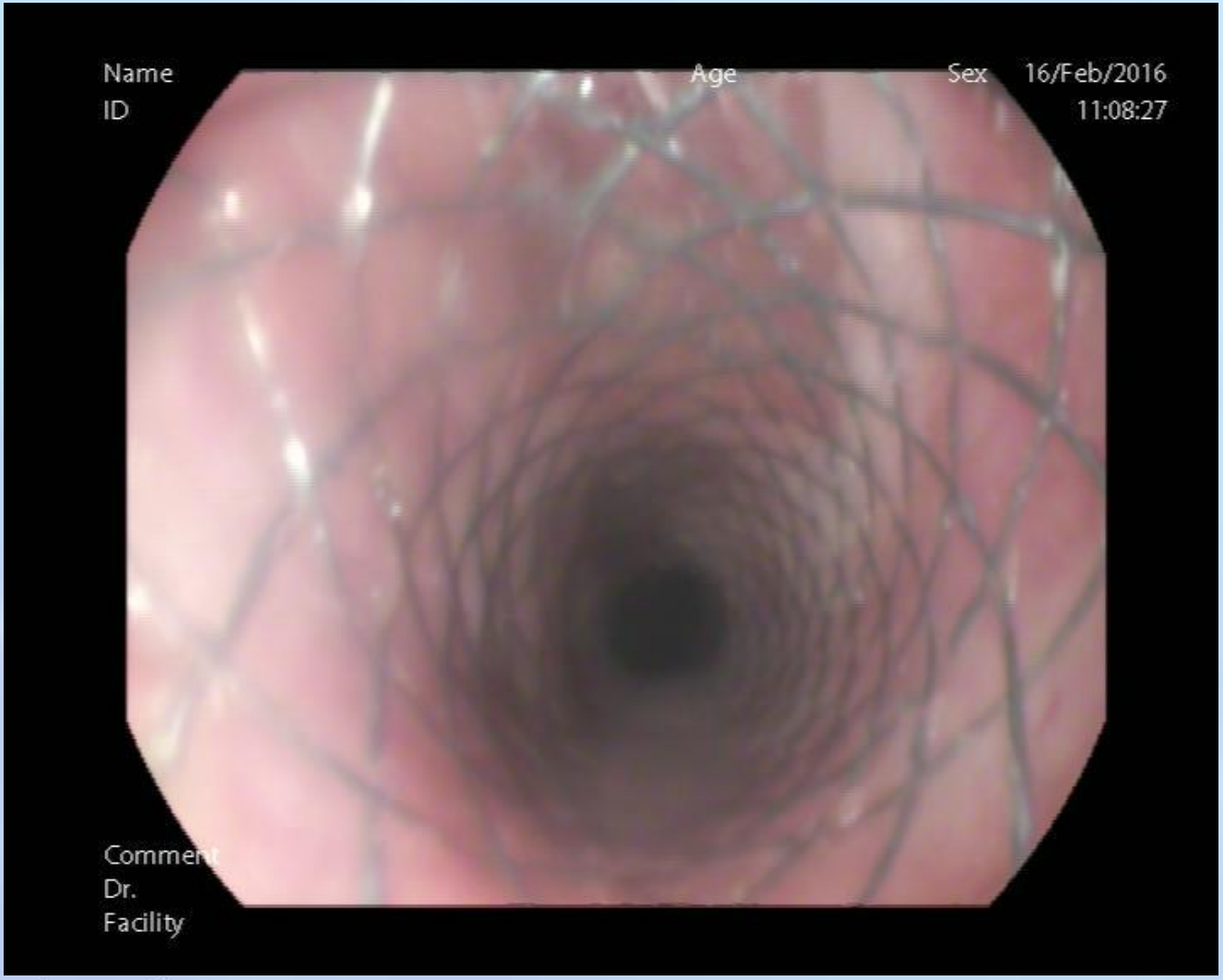

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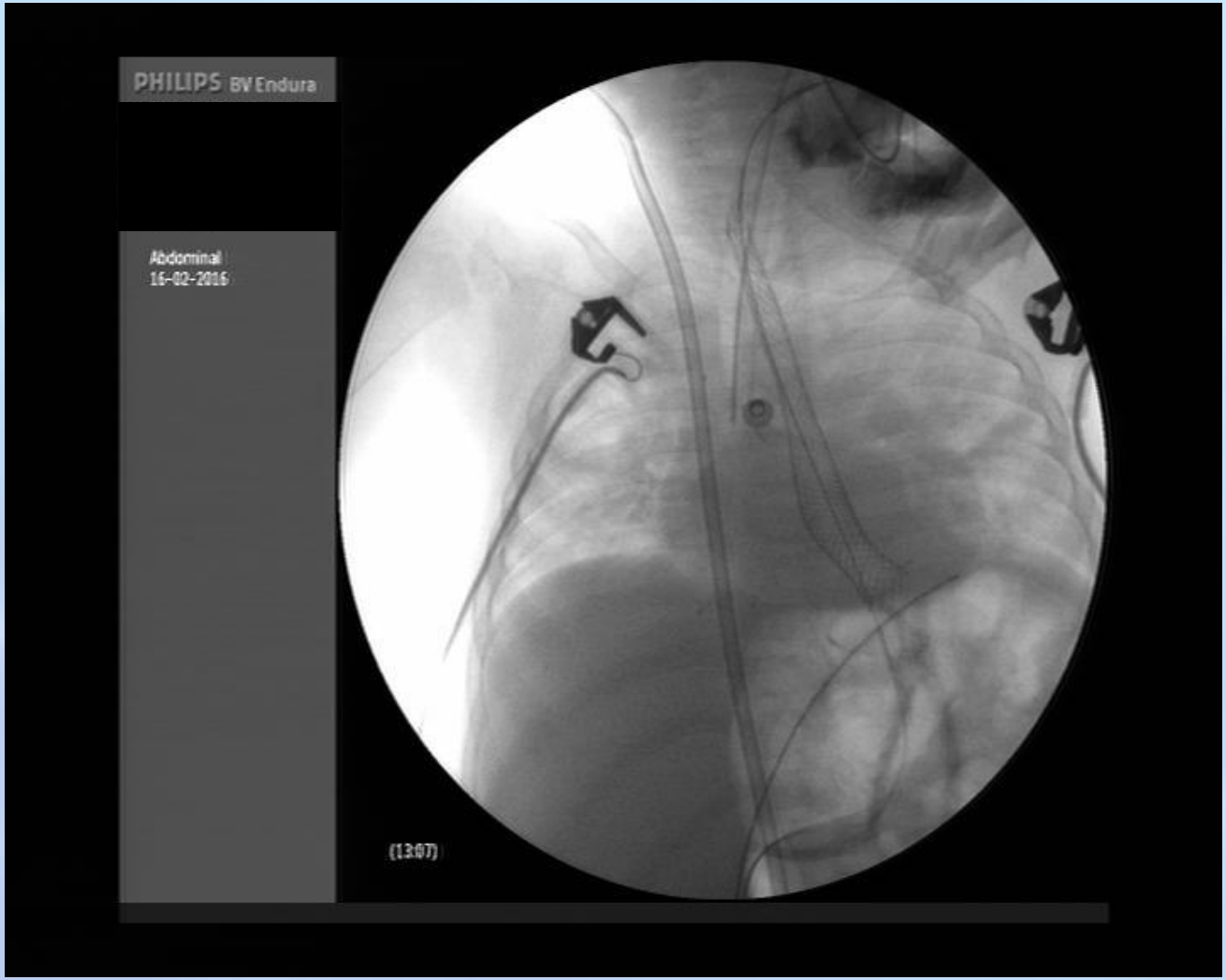

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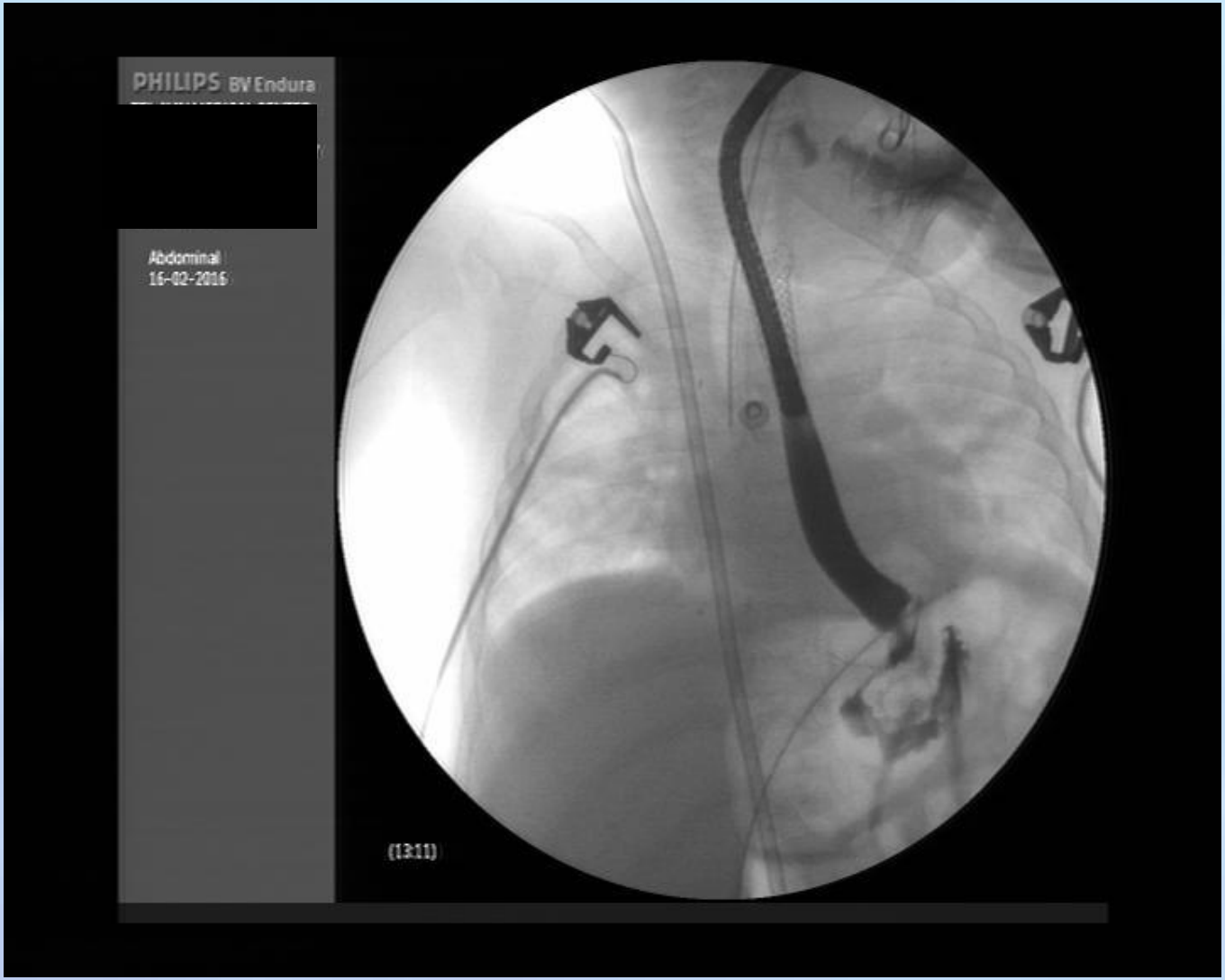
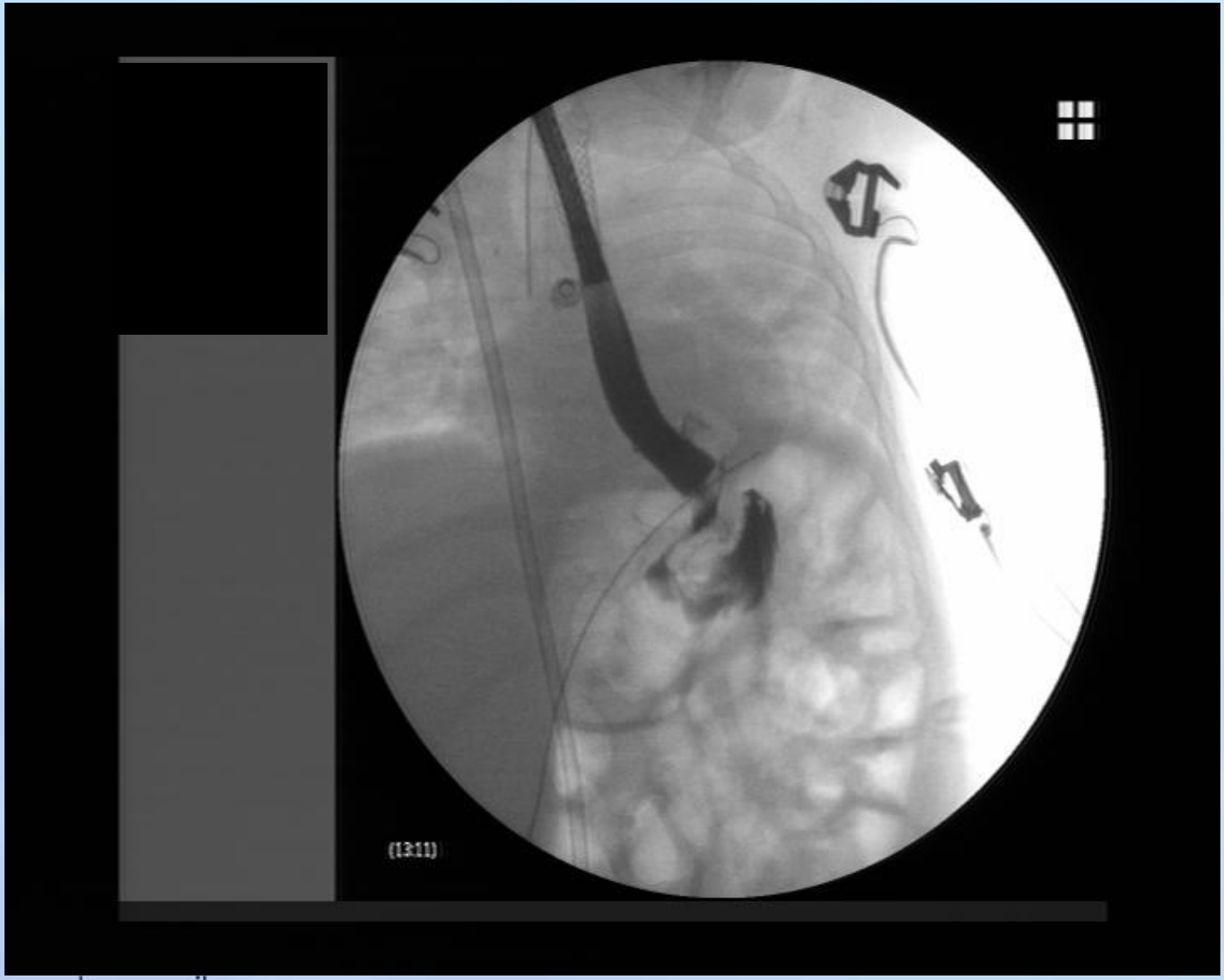


Case 2



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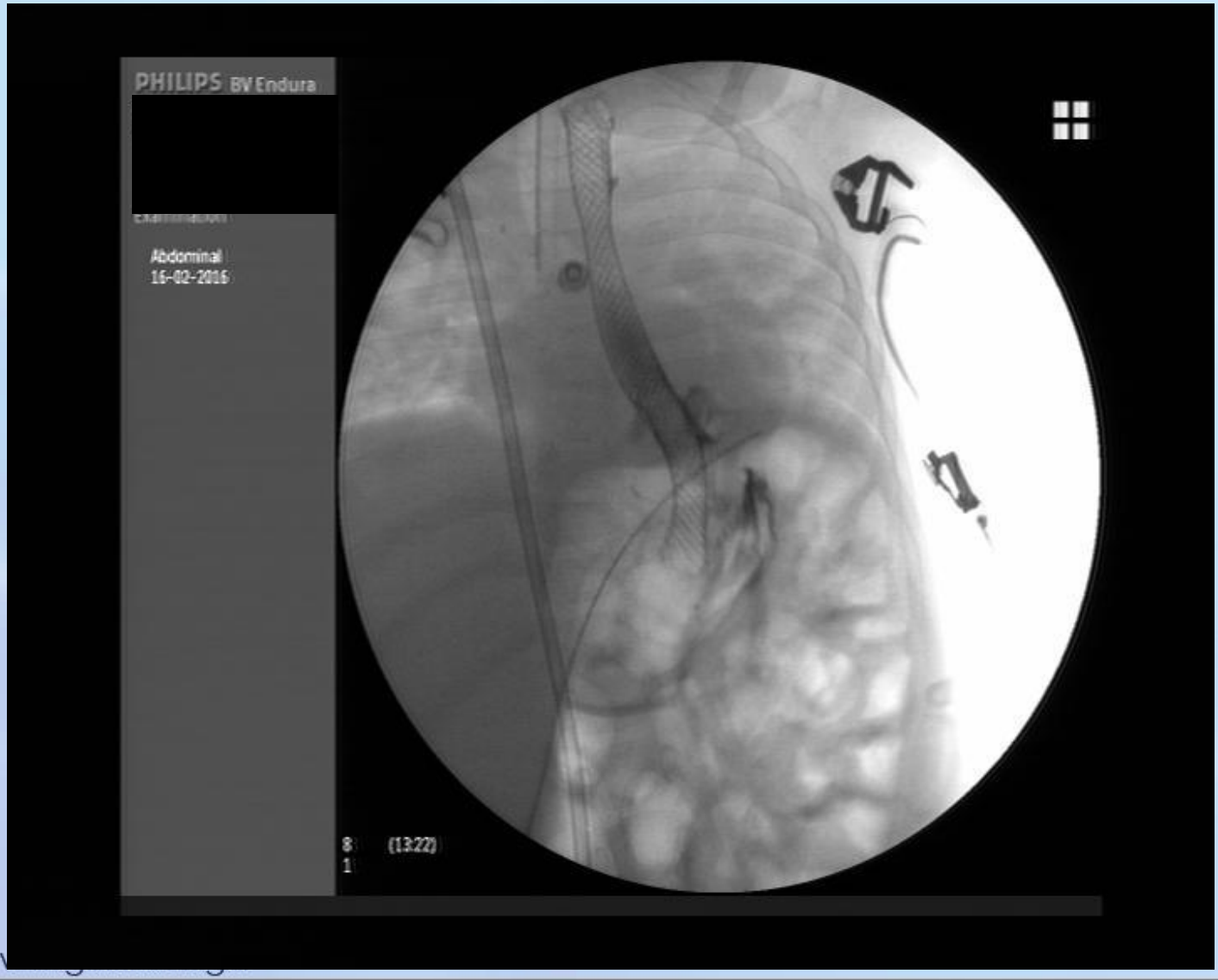
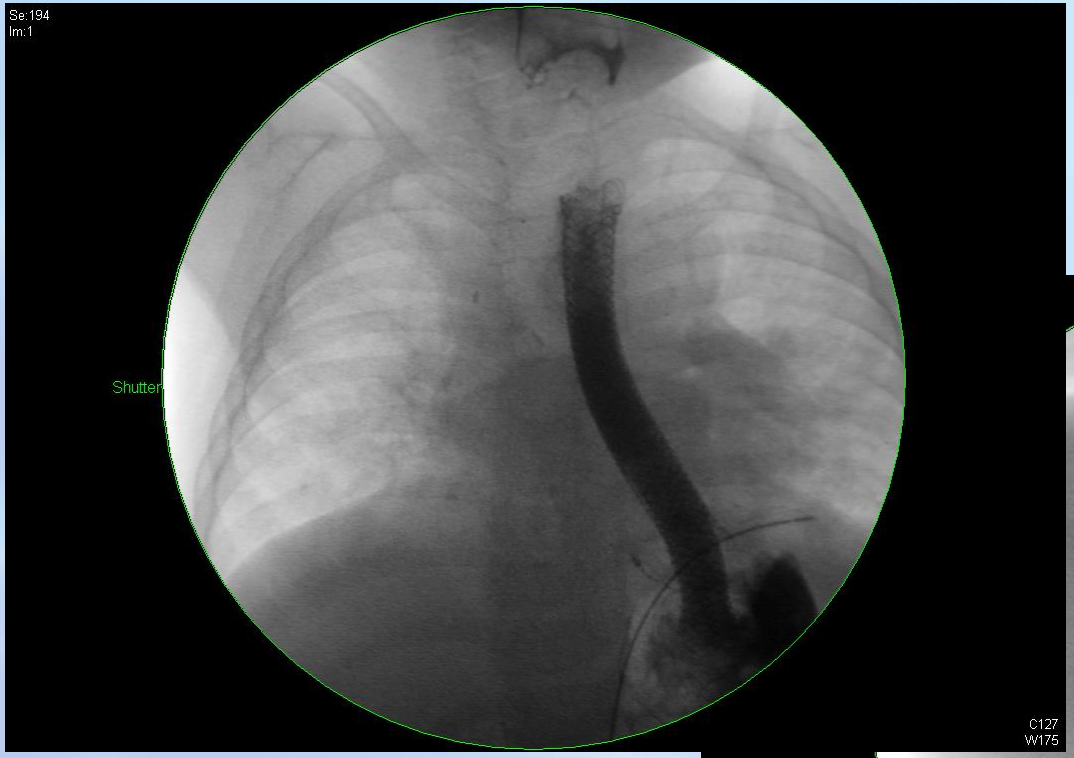
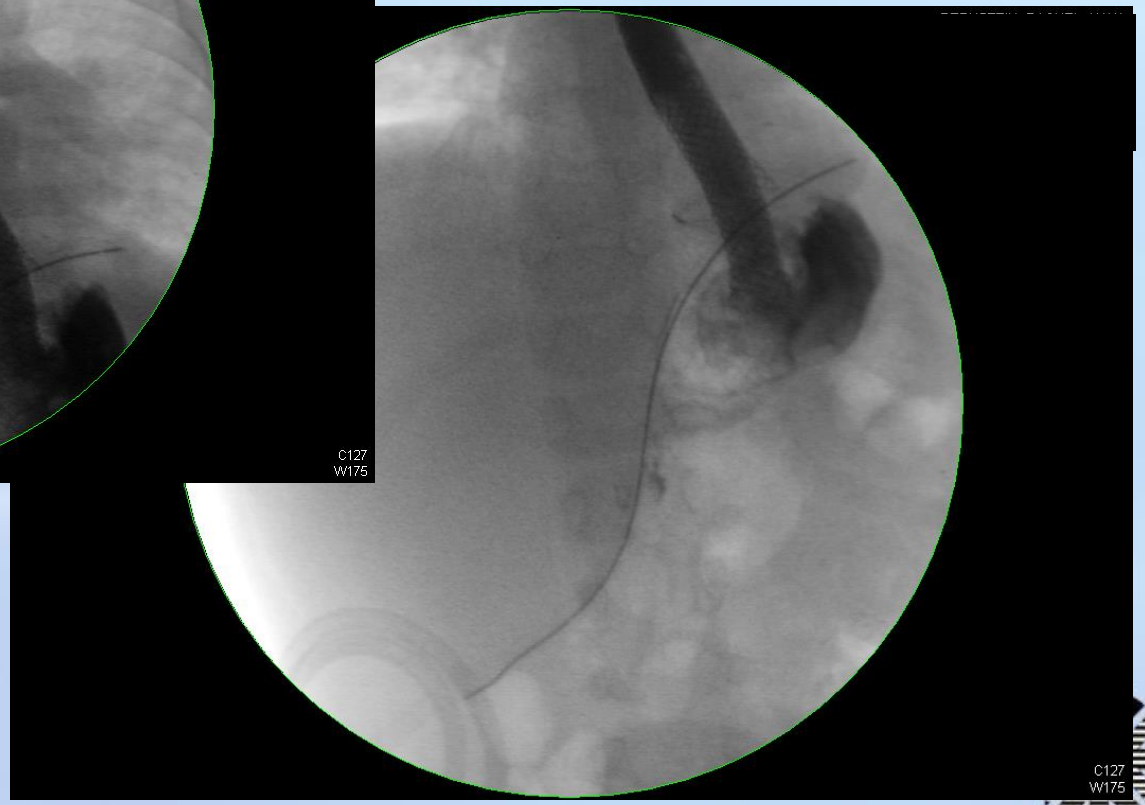


UGI 1 day after



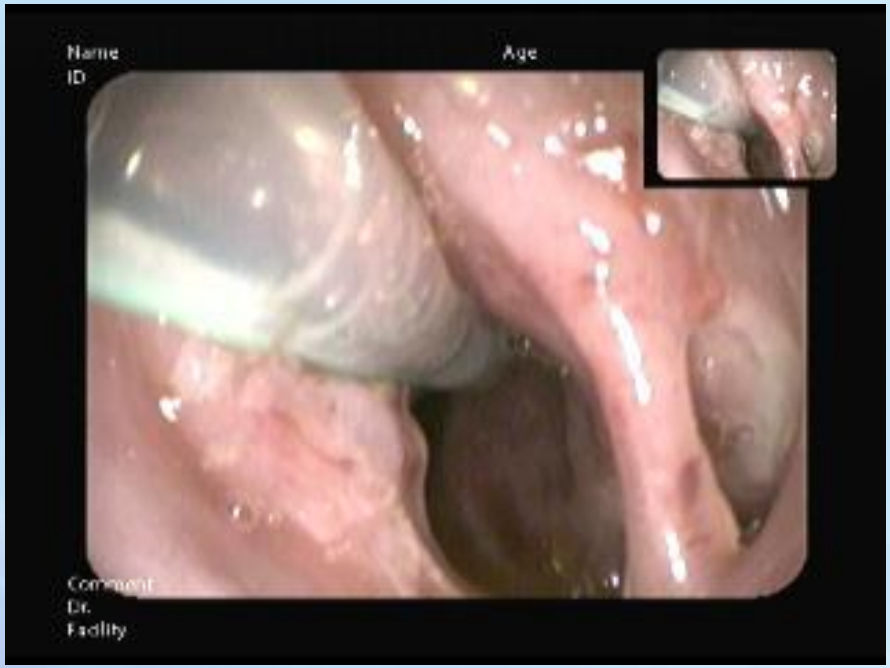


Case 3

- B.S.
- 8 months old boy.
- Congenital Esophageal atresia –type C
- Surgery - end to end anastomosis
- Esophageal stenosis
- Recurrent, multiple fistula
- Severe lung disease

Case 3

Case 3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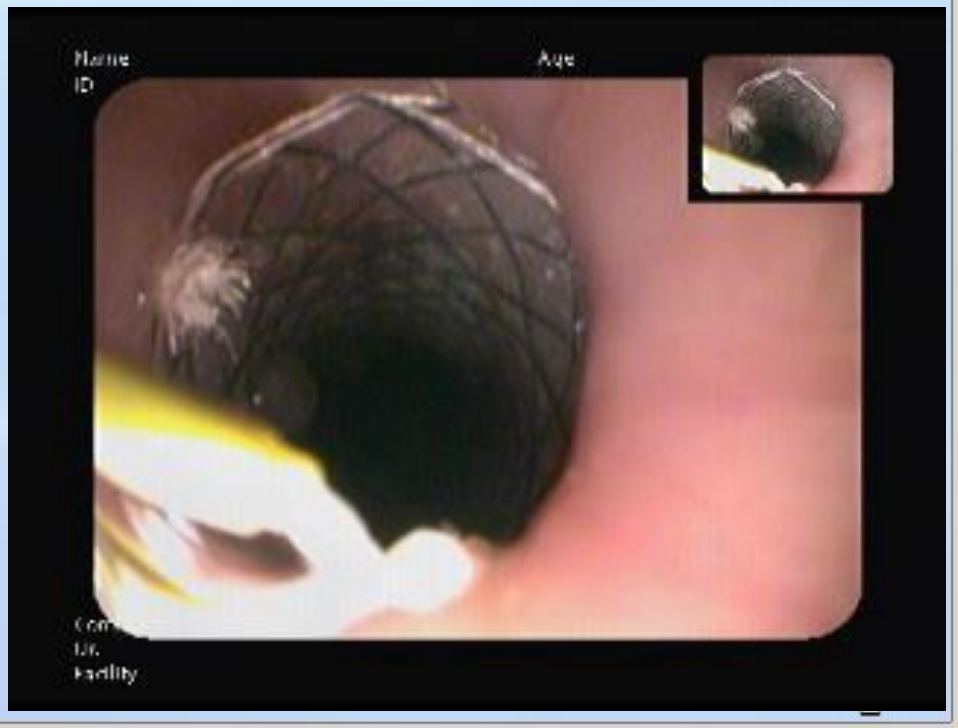
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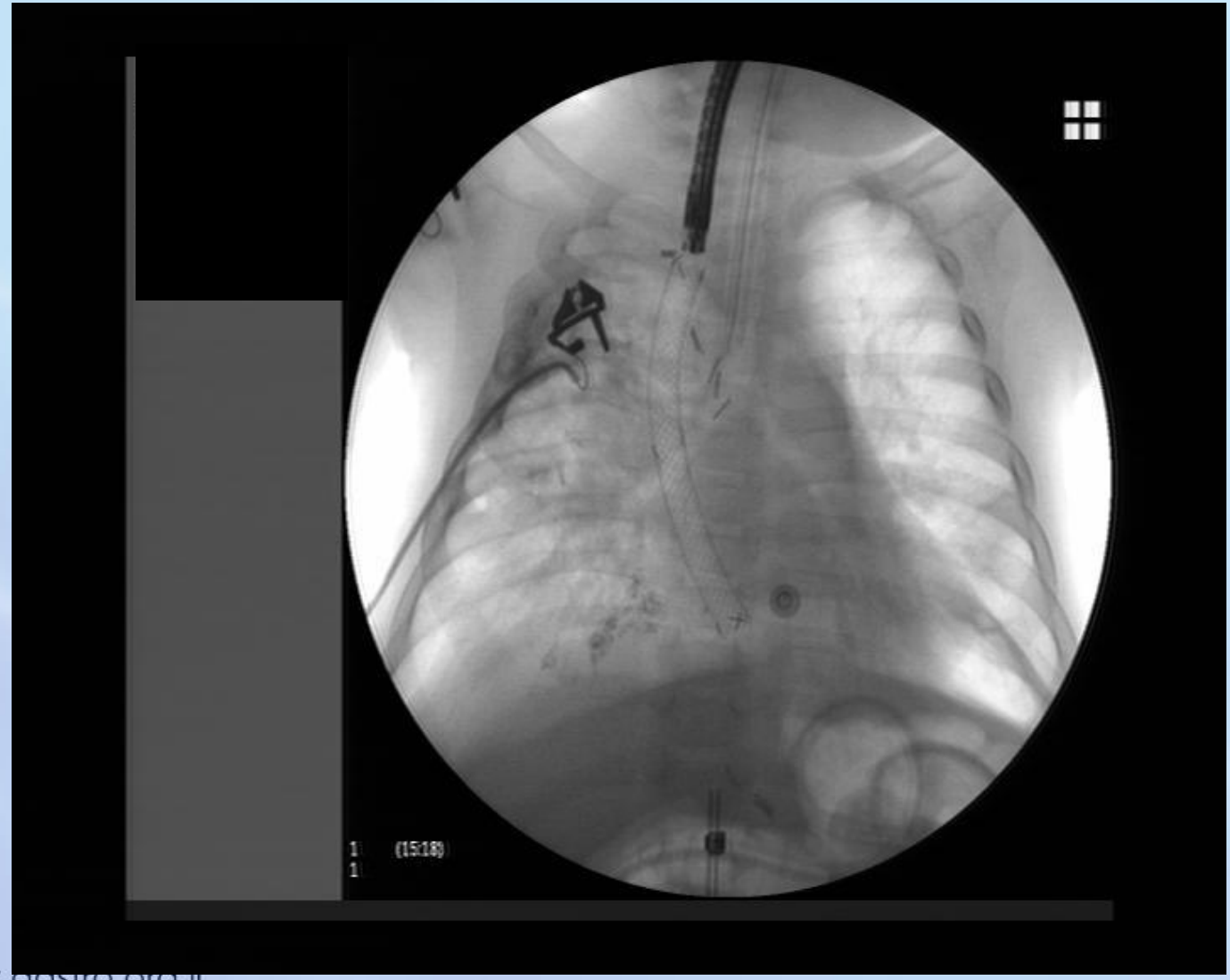
Case 3



Treatments of esophageal stenosis

- Esophageal dilations :
  1. Balloon dilation
  2. Mechanical (bougie) dilators
- Pharmacologic therapy:
  1. Intralesional steroid injection
  2. Mitomycin C
- Surgical treatment

Stents

- Continuous dilatation of the esophagus for prolonged periods of time.
- Types :
- Esophageal stents – too large
- Airway stents – too rigid
- Biliary stents – small and flexible

Adults - stents

- Benign esophageal strictures - success rates 12%- 80% *
- Pooled analysis study **:
  - Stricture success rate (*n*=232) 24.2%,
  - Leaks, perforations, fistulae success rate (*n* = 625) 76.8%
- Complications included
  - stent migration 16.5%
  - granulation tissue 2.7%
  - stent-related perforation 1%
  - chest pain, ulceration, nausea and retching
  - stent-related stricture formation

*Barthel JS. Gastrointest Endosc 2008.

**van Halsema EE. World J Gastrointest Endosc 2015.

Children 1

- 5 children (1.5- 8 years) refractory restenosis
- Fully covered self-expanding metal stent
- Successfully placed and removed
- Follow-up for 4-12 months
- 3- no stricture recurrence
- 2- ulcerative stricture
- Complications - 3 -Stent migration, 1- mild granulation tissue

Zhang J. J Pediatr Surg. 2013

Children 2

- 11 children (1 month-11 years)
- Fully covered self-expandable metal stents
- Median duration - 29 days
- Successfully placed and removed
- At follow-up:
- 6 – success, no further intervention
- 2 - one single dilatation after stent removal
- 3 - no improvement -> surgery
- Complications – in 5 cases: GER, migration, pneumonia

Lange B. J Laparoendosc Adv Surg Tech A. 2015

Children 3

- 24 patients, (3months-12years)
- 41 stents (SEPSs 14, FCSEMSs 27)
- 1-7 stents per patients
- Stricture resolution:
  - 39% at 30 days
  - 26% at 90 days.

- Complications :
  - Migration 12%
  - Granulation tissue 24%
  - Deep tissue ulcerations 14%
  - Pain and retching 24%

Manfredi MA. Gastrointest Endosc 2014.

Children 3

- Leaks, perforations, fistulae:
- Among them 14 with esophageal leaks
- 9/14 (64%) closure after stent therapy
- 80% closure after dilation perforation
- 25% closure after surgical repair perforation

Manfredi MA. Gastrointest Endosc 2014.

Summary

- Paucity of data on the use of endoscopic stents placement in children
- Stents should be considered in children with complex esophageal strictures

- The durability of stricture patency will need to be evaluated with follow-up studies as clinically indicated.