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Approaches to locally advanced GEJ cancers: Resection of aorta, pericardium, airway, celiac axis

Too much or fair game?

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Disclosures

None

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Why are we talking about this?

- “Esophagectomy is DEADLY”
- “Esophagectomy is MORBID”
- “Esophagectomy rarely cures”

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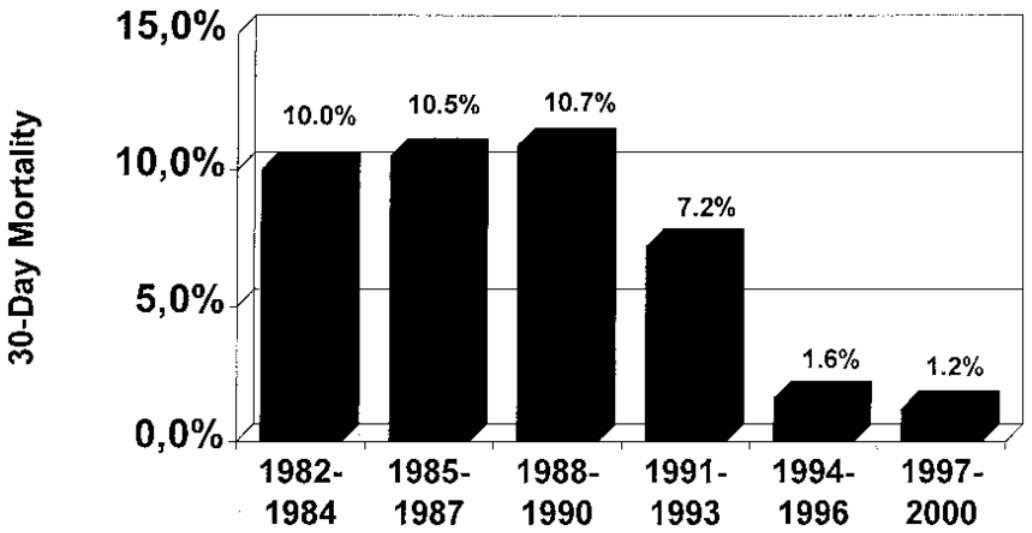
“Esophagectomy is deadly”



STS n=4321: 3.1%
(Raymond et al. Ann Thorac Surg. 2016)

Japanese NCD n=5345; 3.4%
(Takeuchi et al. Ann Surg. 2014)

ACS-NSQIP: n=1032 3.0%
(Dhungel et al. J Gastrointest Surg. 2010)

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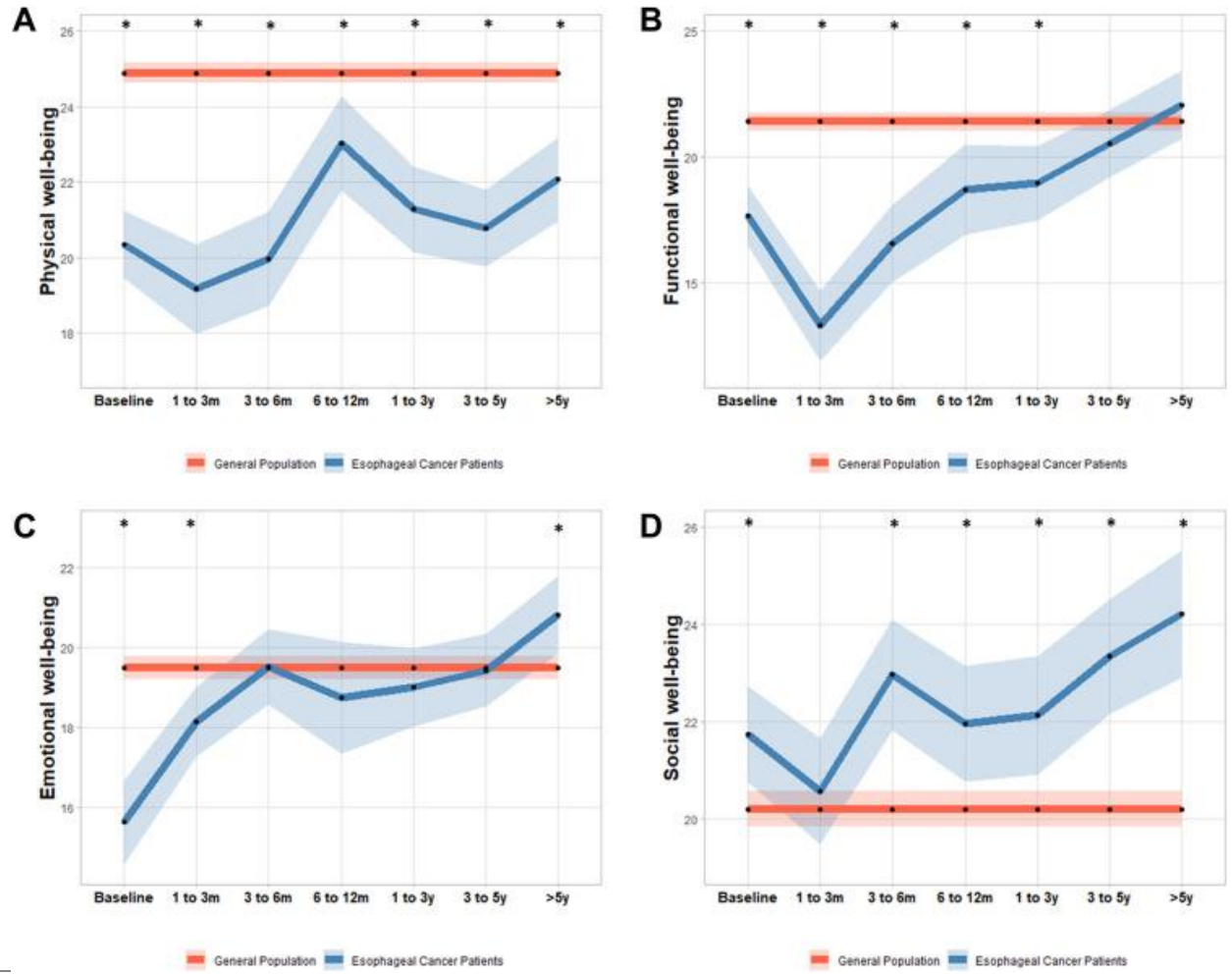
“Esophagectomy is morbid”

- Modern series
  - Median LOS: 7 days
  - Leak rate: <5%
- Long term QOL is excellent



Katz et al. 2023. Ann Thorac Surg

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“Esophagectomy rarely cures”

Surgery is needed in all current curative-intent treatment paradigms

- Neoadjuvant chemoradiation; perioperative chemotherapy; total neoadjuvant therapy.. Etc.

- Surgery versus active surveillance for oesophageal cancer (SANO) trial
  - CCR after chemorads
  - 48% had locoregional recurrence at 2 years (van der Wilk et al. Abstract)
    - (Mixed SCC and EAC)

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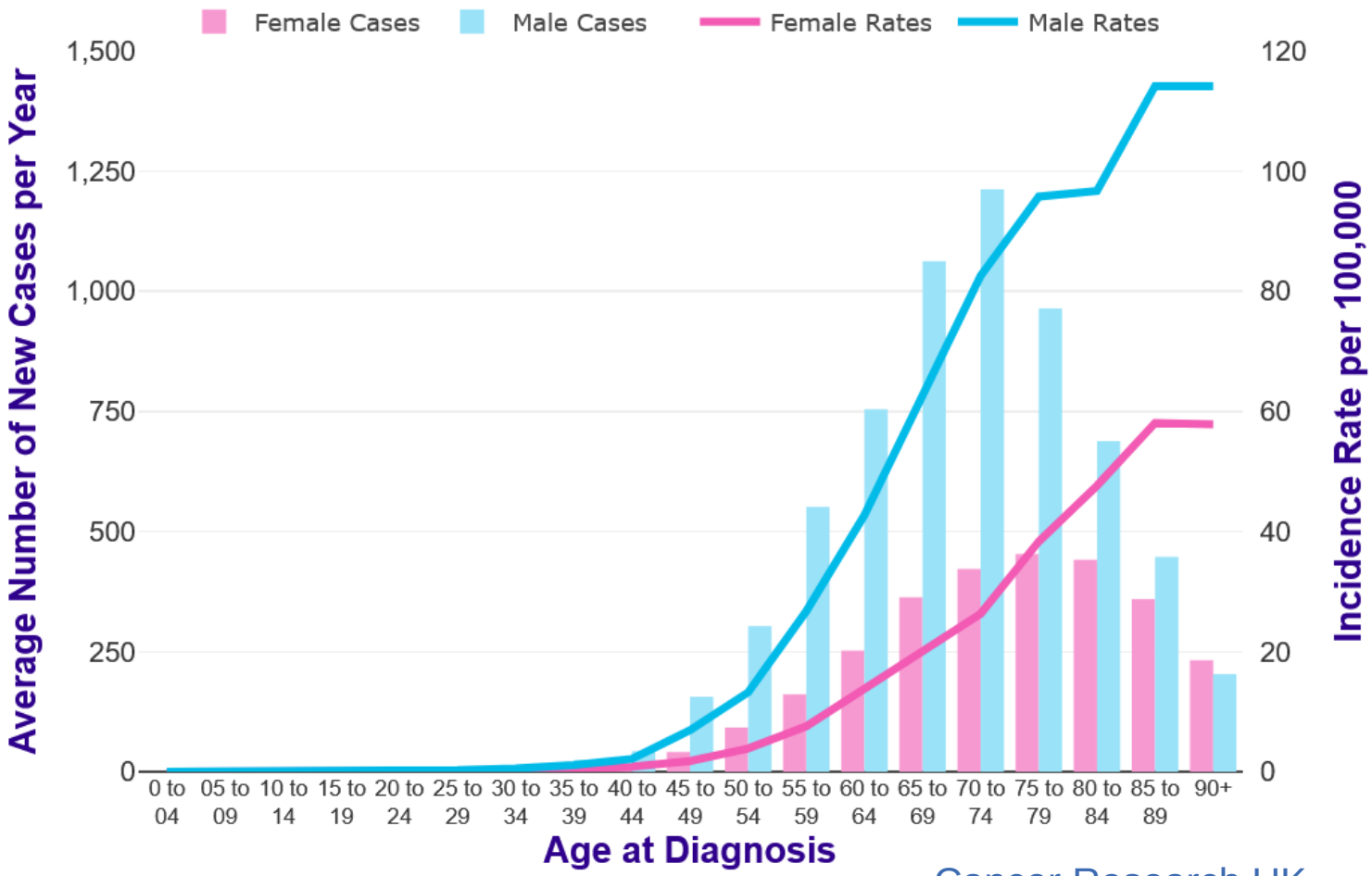
Patient population is changing



Cancer Research UK

- No longer the old alcoholic/smoker with “bad protoplasm”

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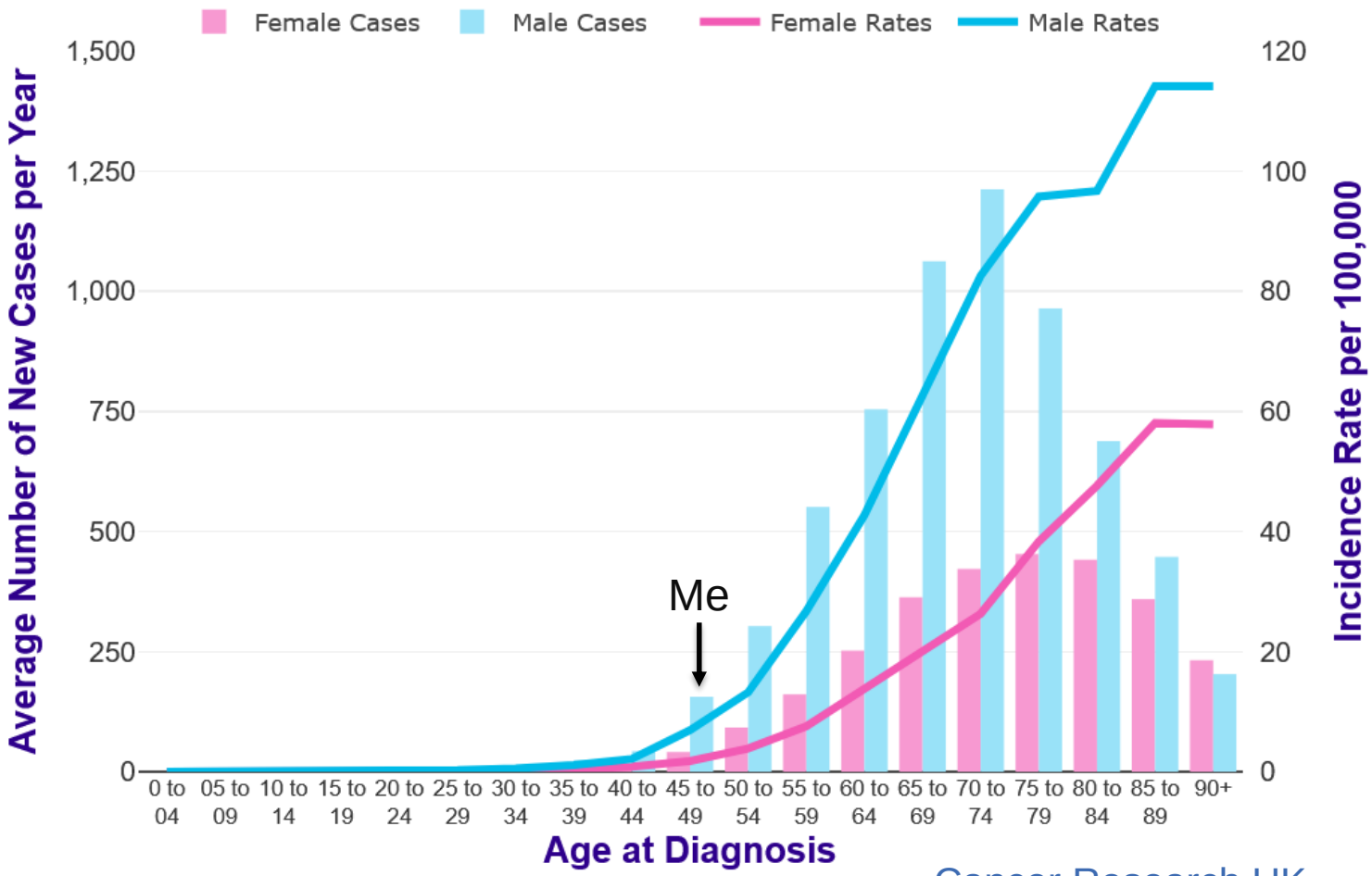
Patient population is changing



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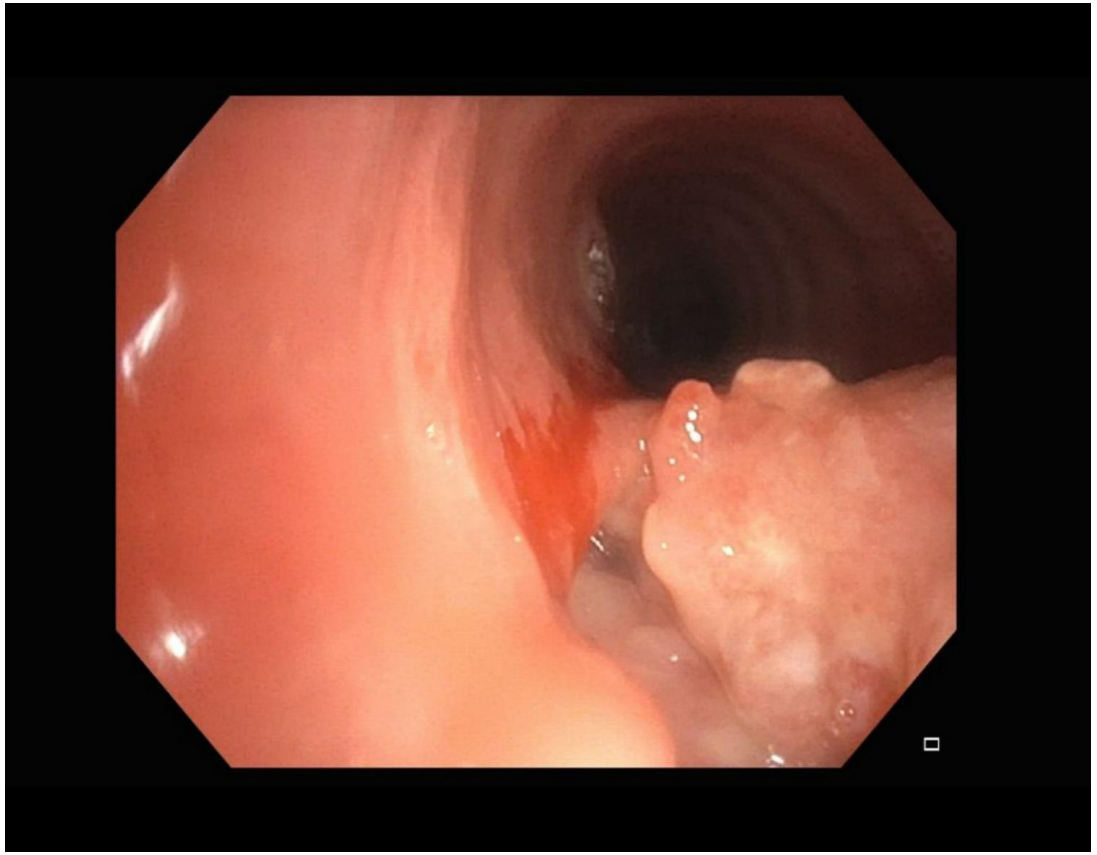
Now what?



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Literature

- Difficult to study topic
  - Still a rare population (locally advanced with no mets)
- Miyata et al. J Surg Onc. 2012
  - 169 patients T4 without mets

TABLE I. Characteristics of 169 Patients With T4 Tumors and No Distant Metastasis

	Total	Induction chemotherapy	Induction CRT	*P* value
n	169	79	90	
Age (years)[a]	62.6 ± 8.1	62.2 ± 8.7	63.0 ± 7.6	0.8676
Gender				
Male	144 (85)	68 (86)	76 (84)	0.7657
Female	25 (15)	11 (14)	14 (16)	
Tumor location				
Upper third	65 (38)	28 (35)	37 (41)	0.1816
Middle third	77 (46)	34 (43)	43 (48)	
Lower third	27 (16)	17 (22)	10 (11)	
Tumor length on CT cross-section (mm)[a]	39.9 ± 12.9	40.6 ± 13.8	39.1 ± 11.8	0.4398
T4 organ				
Trachea	107 (63)	47 (60)	60 (66)	0.0707
Aorta	30 (18)	12 (15)	18 (20)	
Trachea + aorta	10 (6)	4 (5)	6 (7)	
Others	22 (13)	16 (20)	6 (7)	
cN				
cN0	36 (21)	9 (11)	27 (30)	0.0032
cN1	113 (79)	70 (89)	63 (70)	
cM				
cM0	111 (66)	41 (52)	70 (78)	0.0004
cM1lym	58 (34)	38 (48)	20 (22)	

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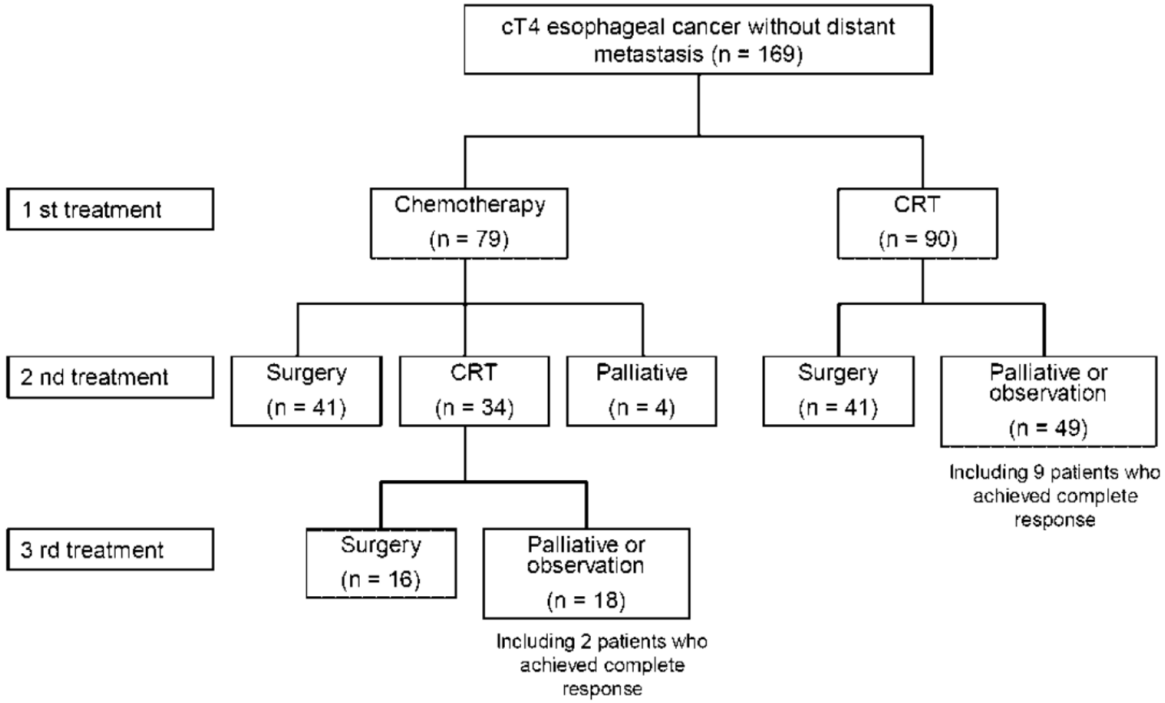
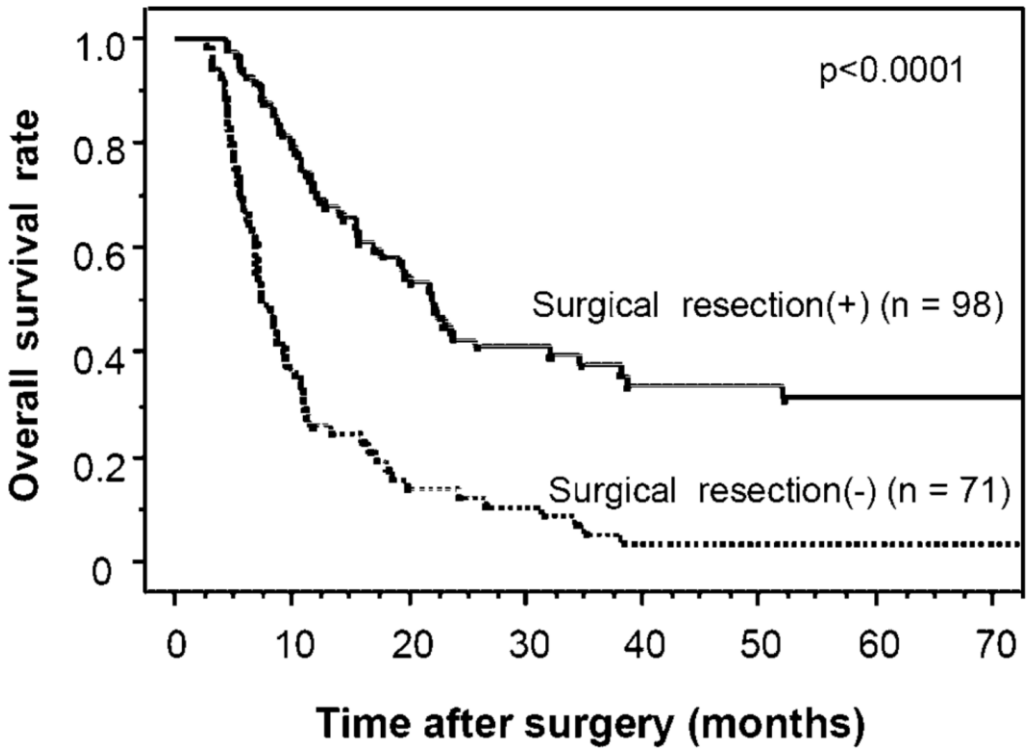
Literature

- Miyata et al. J Surg Onc. 2012





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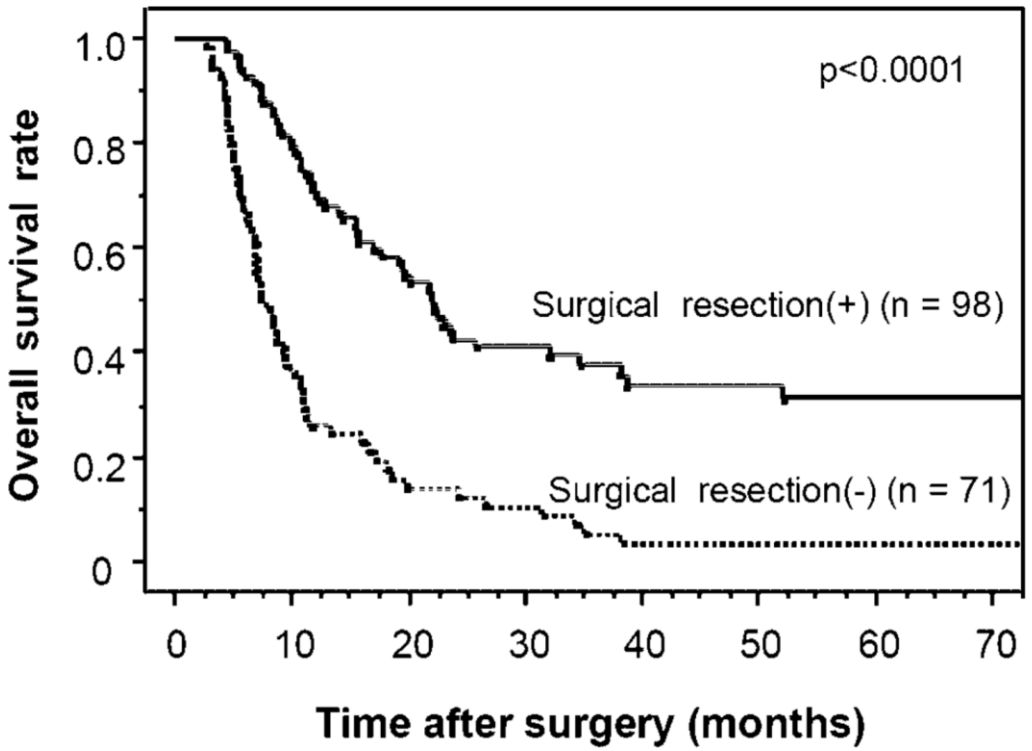
Literature

- Miyata et al. J Surg Onc. 2012

- Biology is SCC
- Was it really invading?
- What were the details of the operation?
- Airway resection? Aortic resection?



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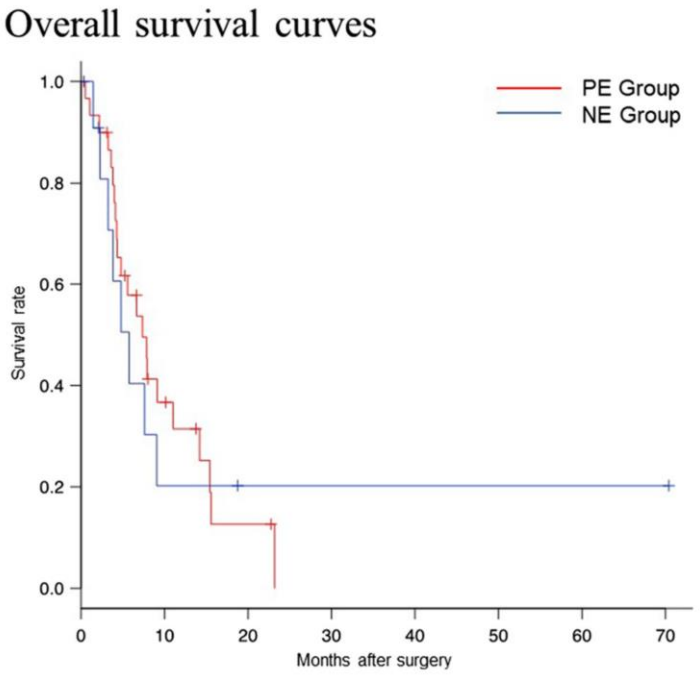
Literature

- Fujii et al. Langenbeck's Arch 2023
- R2 "palliative esophagectomy" vs best supportive care



Overall survival curves are shown. The red curve indicates the PE group, and the blue curve indicates the NE group. There are no significant differences, but there is one case of long-term survival in the NE group. PE, palliative esophagectomy with R2 resection; NE, other procedures (e.g., esophagostomy only) without esophagectomy.

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T4a vs T4b?

- What if you can get an R0?
- What is the difference between taking a cuff of pericardium (T4a) and taking a piece of aorta (T4b)?

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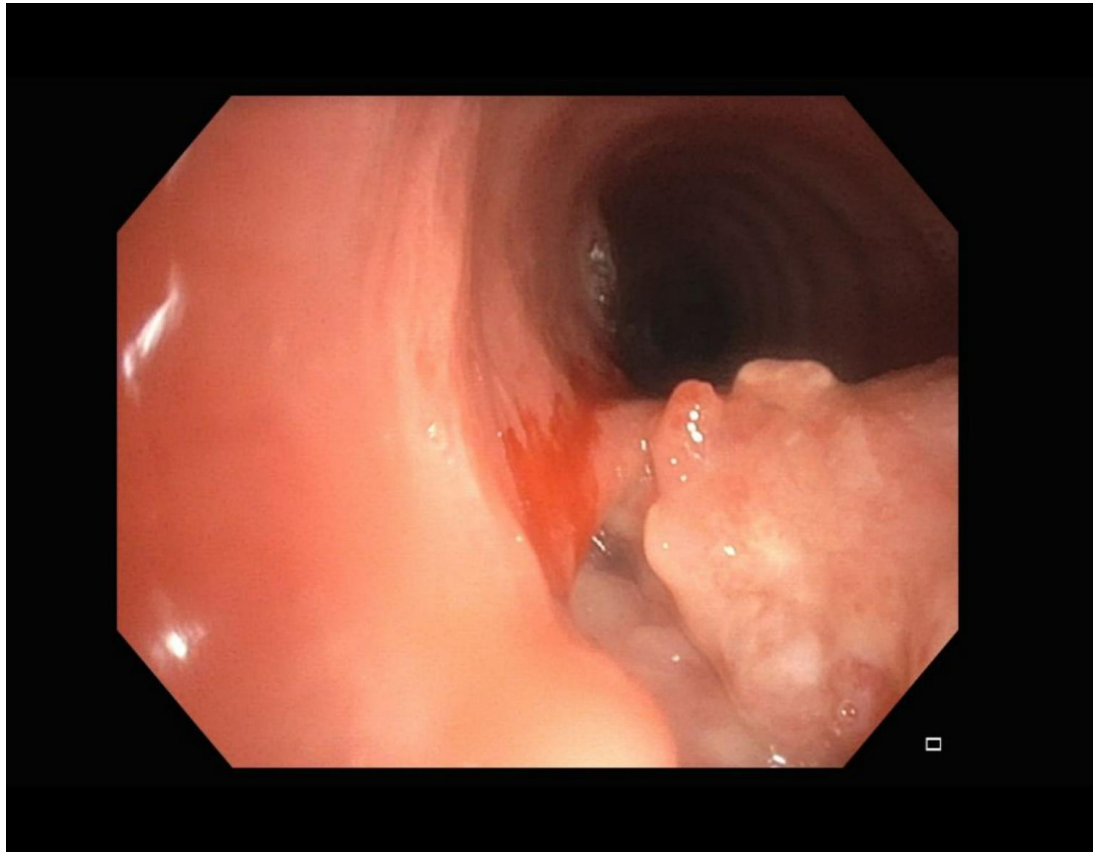
T4b Tracheal invasion



How do you treat?

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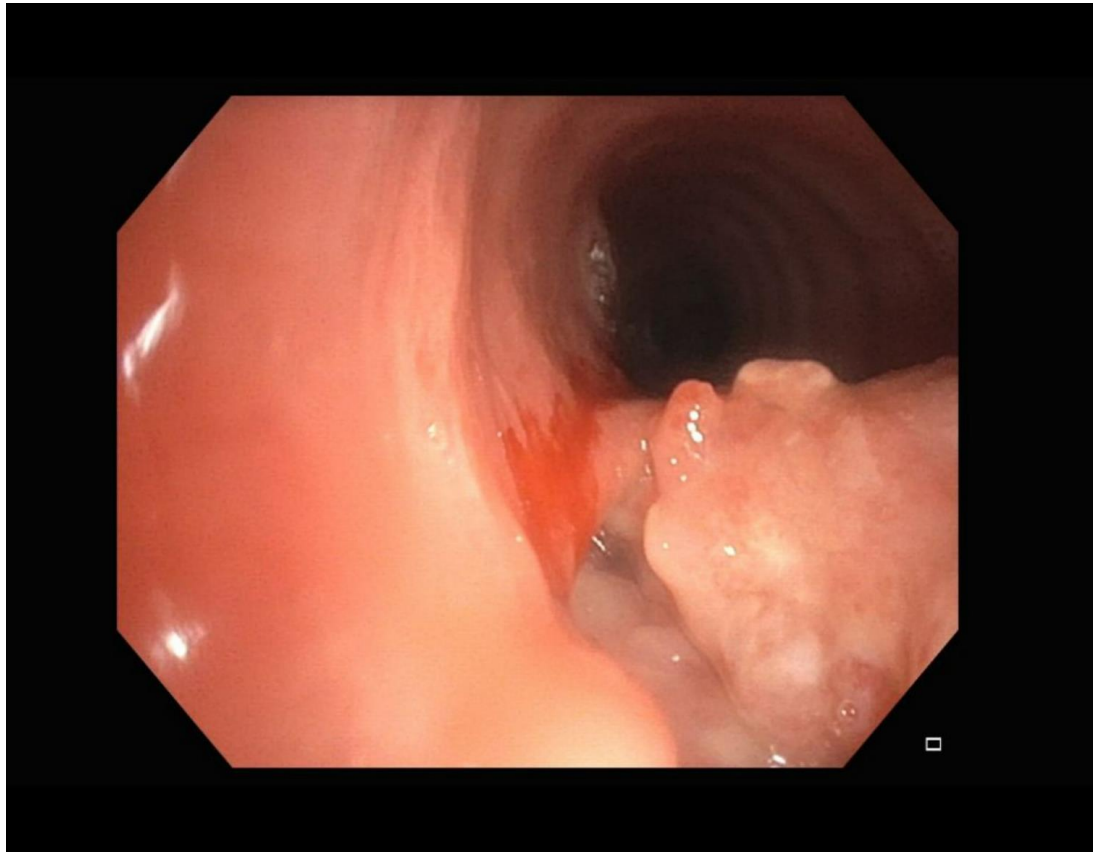
T4b Tracheal invasion



How do you treat?

Palliation?
Chemorads?

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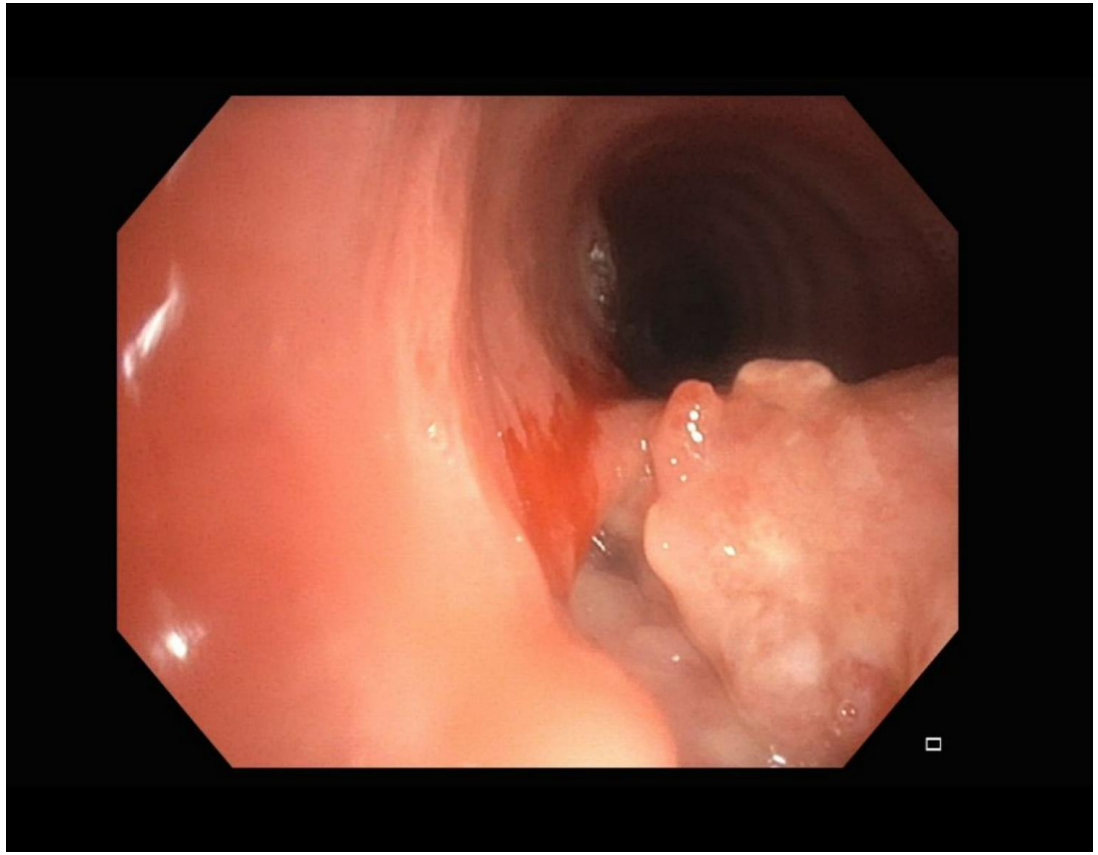
T4b Tracheal invasion



How do you treat?

Palliation?

- Hard to palliate symptoms

Chemorads?

- Worsen TEF

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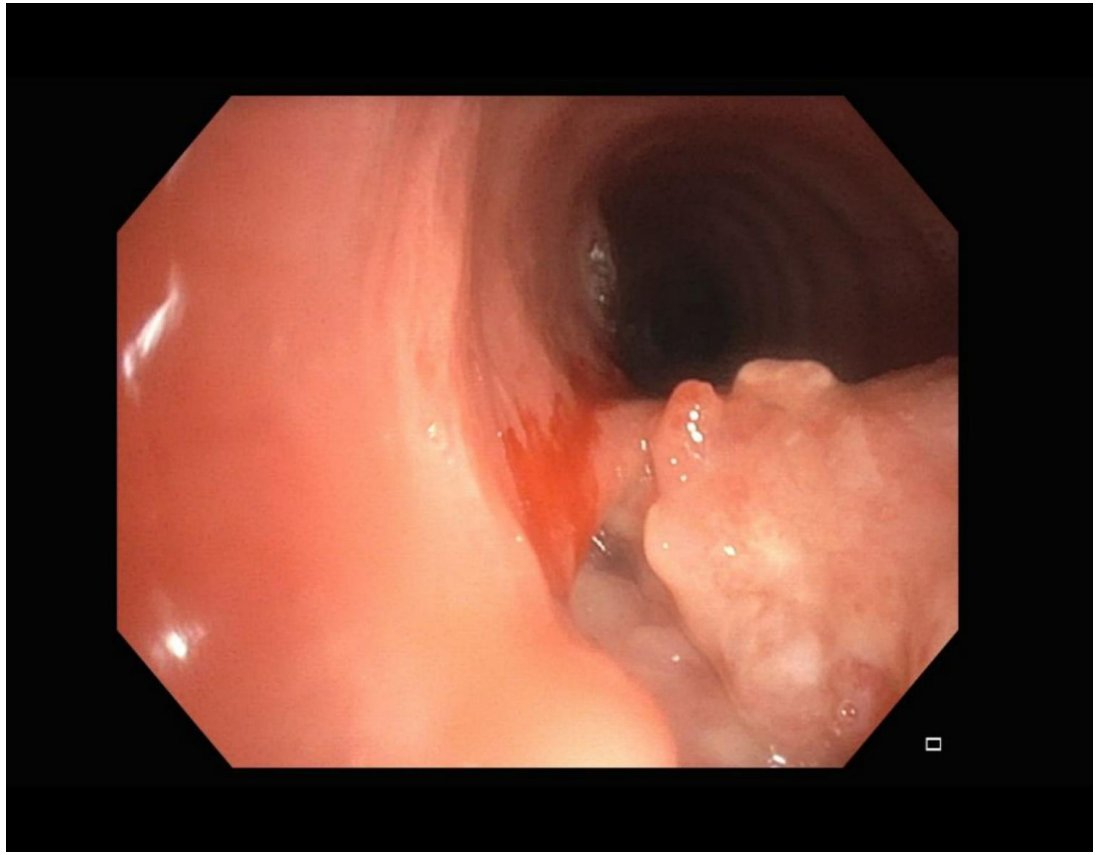
T4b Tracheal invasion



54yo woman

Previous radiation to neck for SCC

Otherwise healthy

Tumor at 18cm from incisors
Metastatic workup negative

Resect

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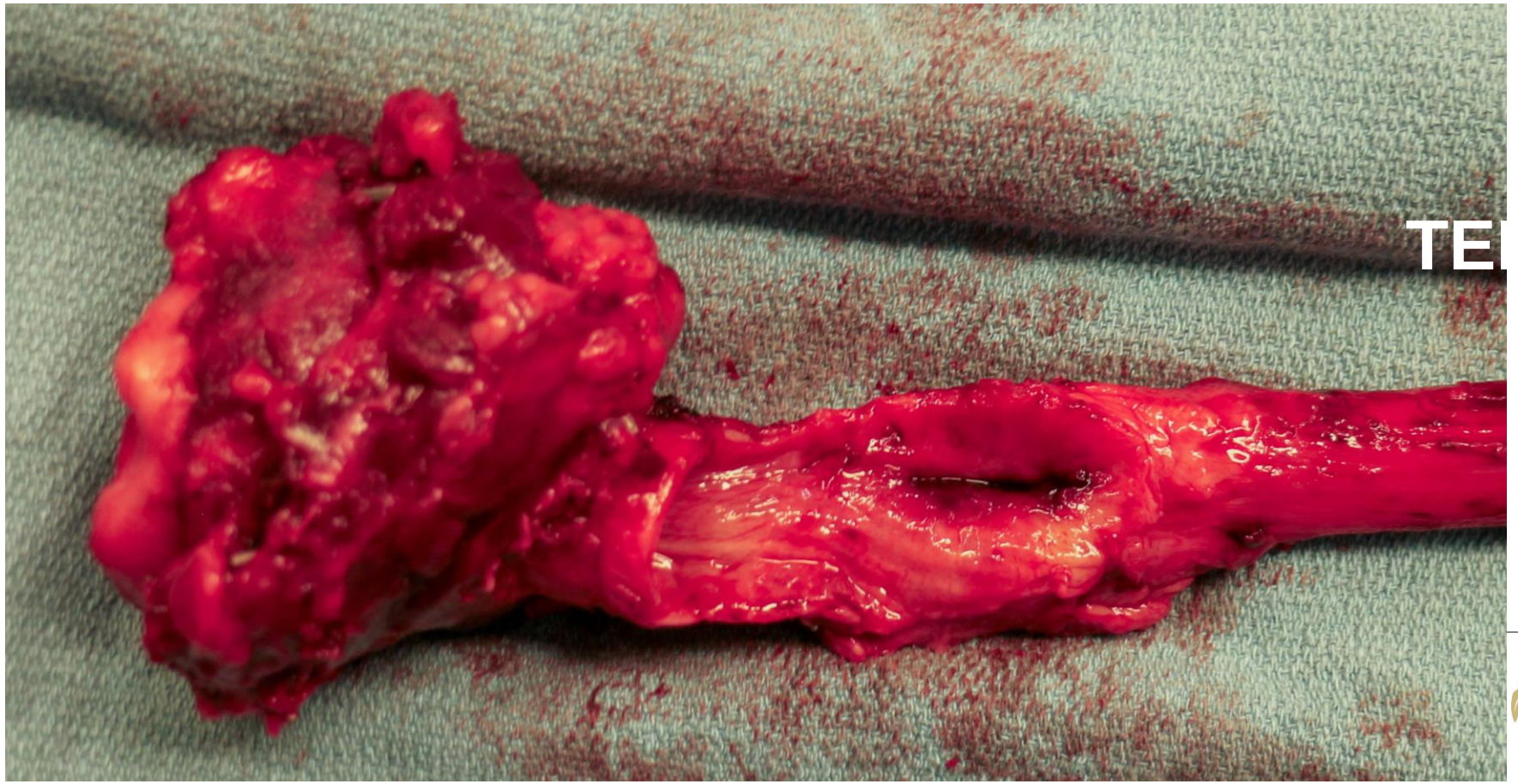
T4b Tracheal invasion

Pharyngolaryngoesophagectomy with tracheal resection and reconstruction with ALT



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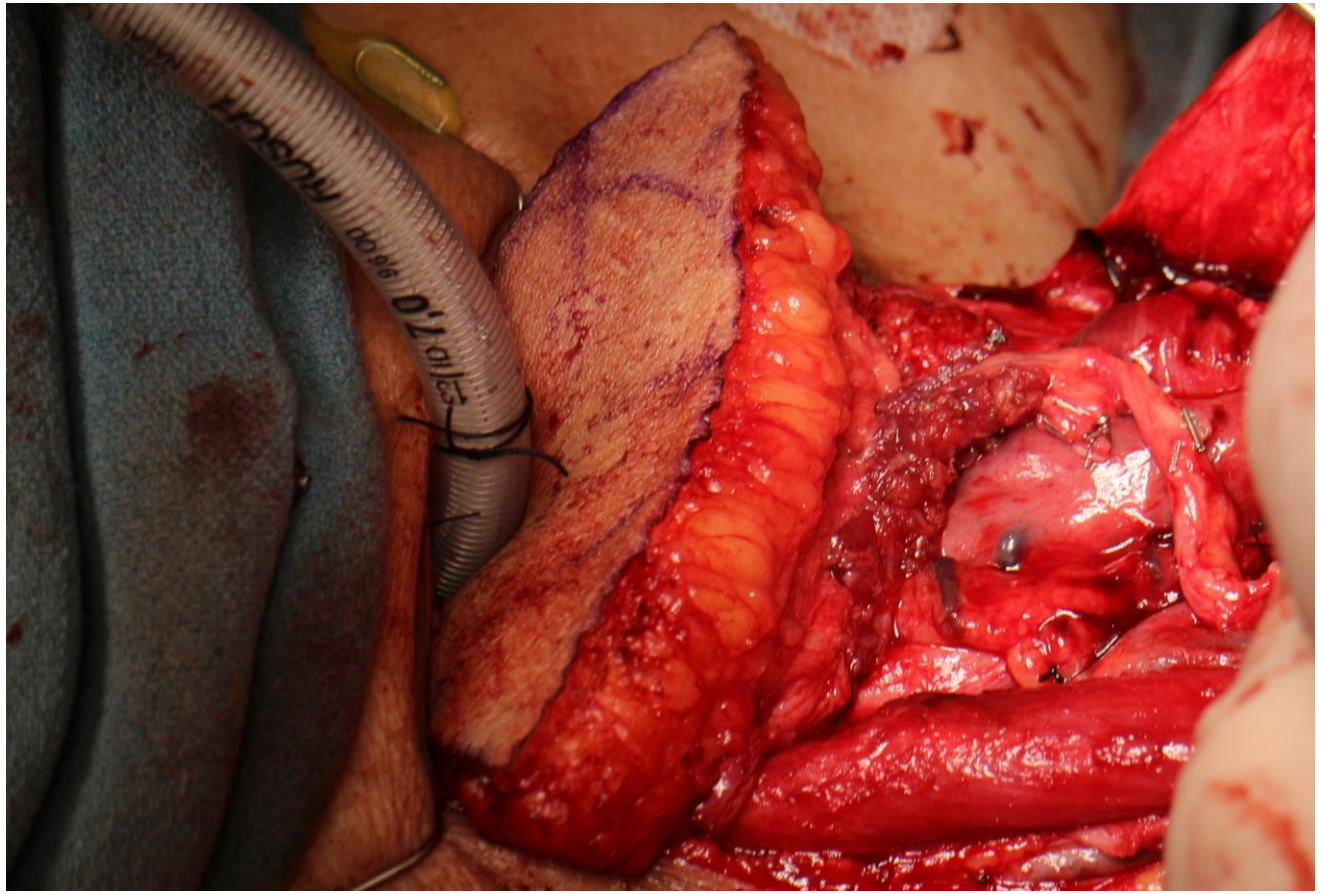
T4b Tracheal invasion



4. Pharynx, larynx, oesophagus, proximal stomach, total pharyngo-laryngo-oesophagectomy, proximal gastrectomy:
-Recurrent moderately differentiated squamous cell carcinoma of the proximal oesophagus
-Tumour extends into the tracheal submucosa, rpT4b
-Fifteen lymph nodes negative for carcinoma (0/15) rpN0
-All margins negative (R0)

No recurrence yet (10mo)

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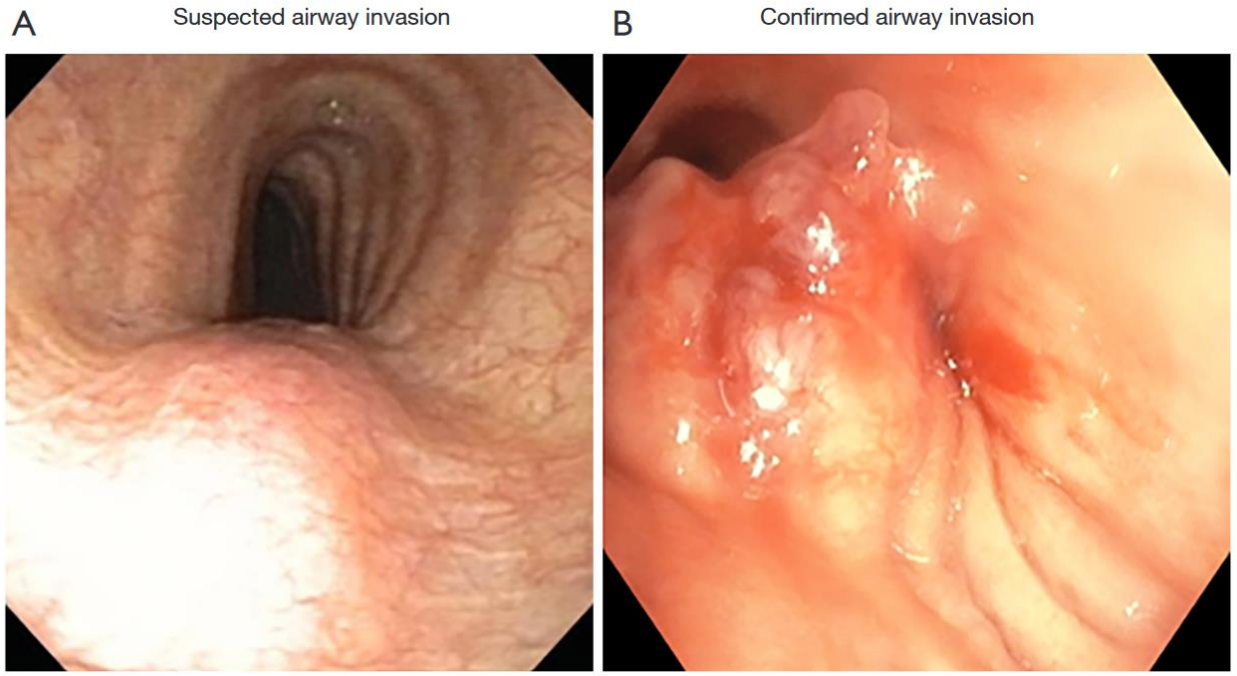
Literature – Tracheal Invasion

- N=14, documented invasion in 8
- 11/14 had induction therapy



Alkaaki et al. Ann Esophagus 2021

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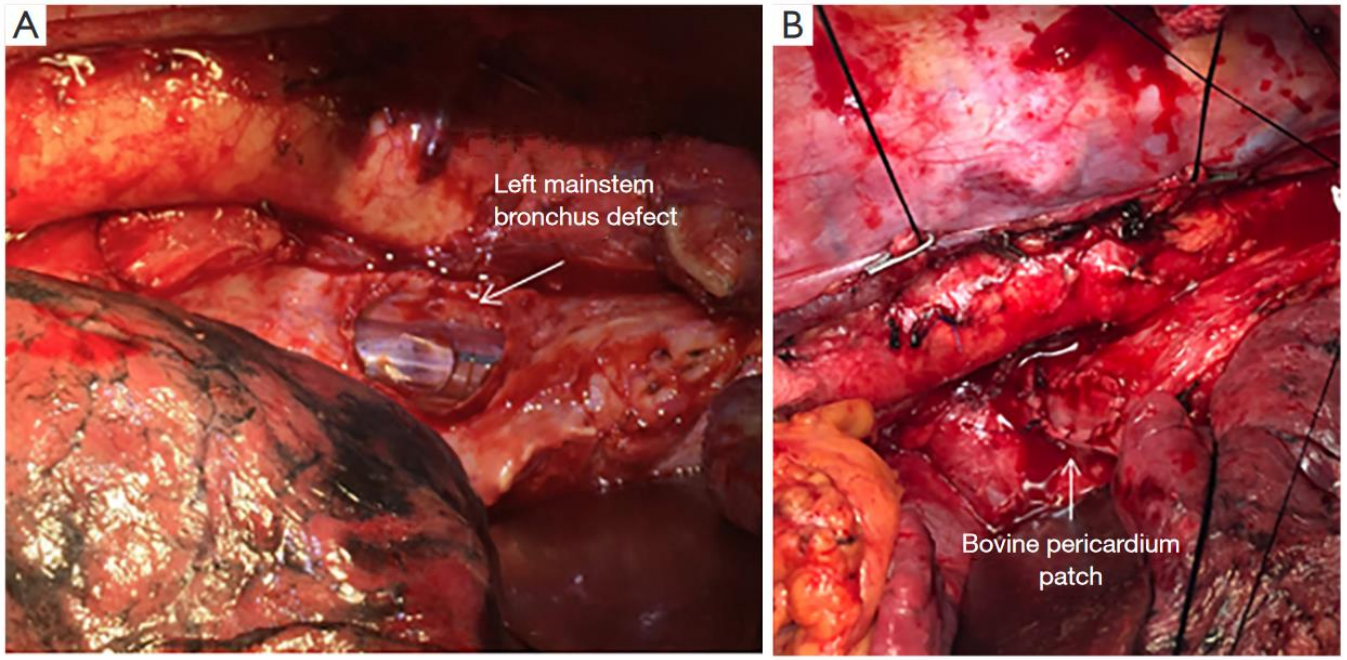
Literature – Tracheal Invasion



Alkaaki et al. Ann Esophagus 2021

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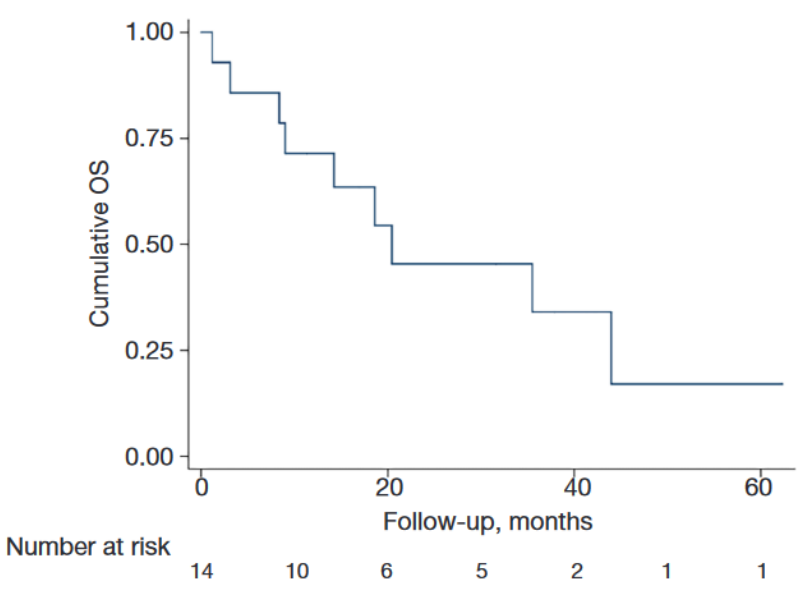
Literature – Tracheal Invasion

2/14 perioperative mortality, airway repair breakdown

Table 4 Individual patient summary and pathological outcome

Patient	Age/sex	Tumour location	T4b status	cN	Induction therapy	Type of induction therapy	Procedure	Type of airway resection	Reconstruction	Operative time	Blood loss	Number of lymph nodes resected	Number of lymph nodes involved by cancer	Margins
1	71 F	Upper 1/3	Suspected	0	No	None	3-hole	Membranous tracheal resection	Bovine pericardium	510	300	58	0	R0
2	77 F	Middle 1/3	Suspected	2	Yes	CRT	Ivor Lewis	Membranous tracheal resection	Bovine pericardium	240	250	37	4	R0
3	80 F	Upper 1/3	Suspected	0	Yes	CRT	3-hole	Membranous tracheal resection	Bovine pericardium	380	500	19	0	R0
4	68 M	Cervical	Confirmed	1	Yes	CT	PLE	PLE + tracheal resection	Pectoralis major muscle flap	600	4,000	81	1	R0
5	56 M	Upper 1/3	Confirmed	1	Yes	CT	PLE	PLE + tracheal resection	Pectoralis major muscle flap	540	50	54	1	R0
6	57M	Middle 1/3	Confirmed	3	Yes	CRT	PLE	Membranous tracheal resection	Pectoralis major muscle flap	540	1,000	48	11	R0
7	67 F	Upper 1/3	Suspected	0	Yes	CRT	3-hole	Membranous tracheal resection	Bovine pericardium	420	1,000	29	0	R0
8	60 F	Middle 1/3	Suspected	0	Yes	CRT	Ivor Lewis	Membranous L bronchus resection	Bovine pericardium	240	50	13	2	R0
9	65M	Upper 1/3	Confirmed	0	Yes	CRT	PLE	Laryngectomy with proximal trachioectomy	Tracheoplasty	540	50	5	0	R0
10	44M	Upper 1/3	Confirmed	0	Yes	CRT	PLE	Laryngectomy with proximal trachioectomy	Tracheoplasty	370	50	69	0	R0
11	72 M	Upper 1/3	Confirmed	2	No	None	PLE	Laryngectomy with proximal trachioectomy	Tracheoplasty	470	500	108	5	R0
12	51 F	Middle 1/3	Confirmed	1	Yes	CRT	Ivor Lewis	Left pneumonectomy	N/A	290	25	31	0	R0
13	65 M	Cervical	Confirmed	1	No	None	PLE	Laryngectomy with proximal trachioectomy	Tracheoplasty	430	750	41	0	R0
14	32 M	Cervical	Suspected	1	Yes	CRT	PLE	Laryngectomy with proximal trachioectomy	Bovine pericardium	580	400	71	0	R1

PLE, pharyngo-laryngo-esophagectomy.



Alkaaki et al. Ann Esophagus 2021

T4b Celiac axis

These patients can be young

- 38M
  - T1a esophageal ca in Barrett's esophagus 2018
  - Treated with ESD elsewhere
  - Margins negative
  - No LVI

  - **Recurrence 2023**

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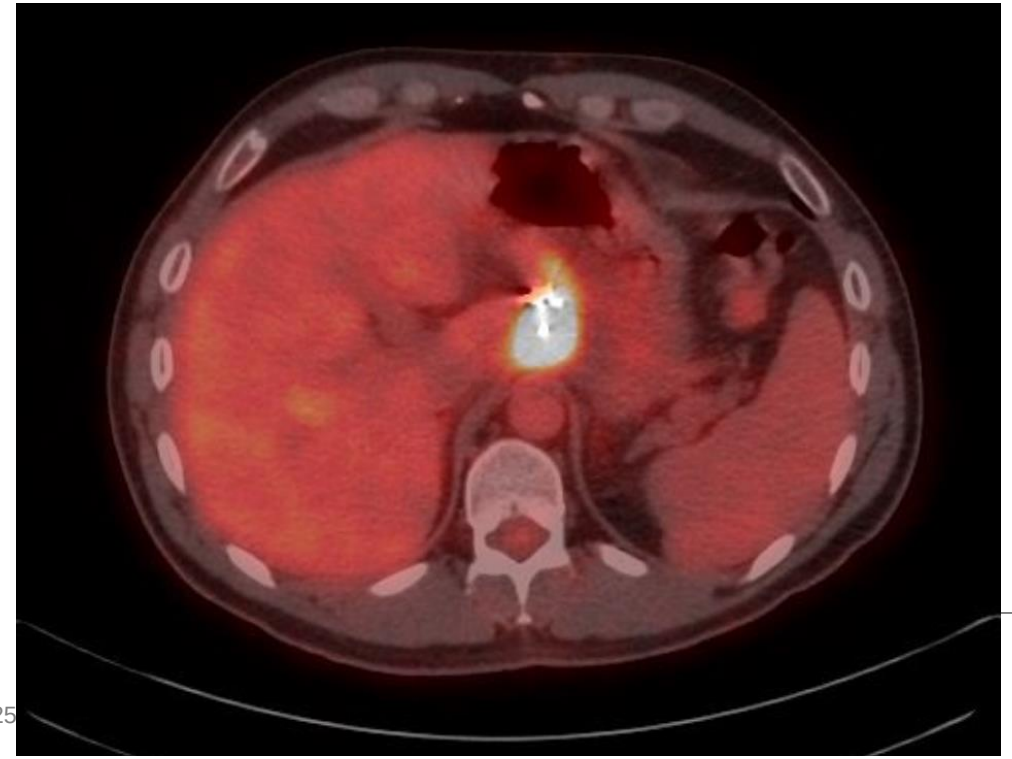
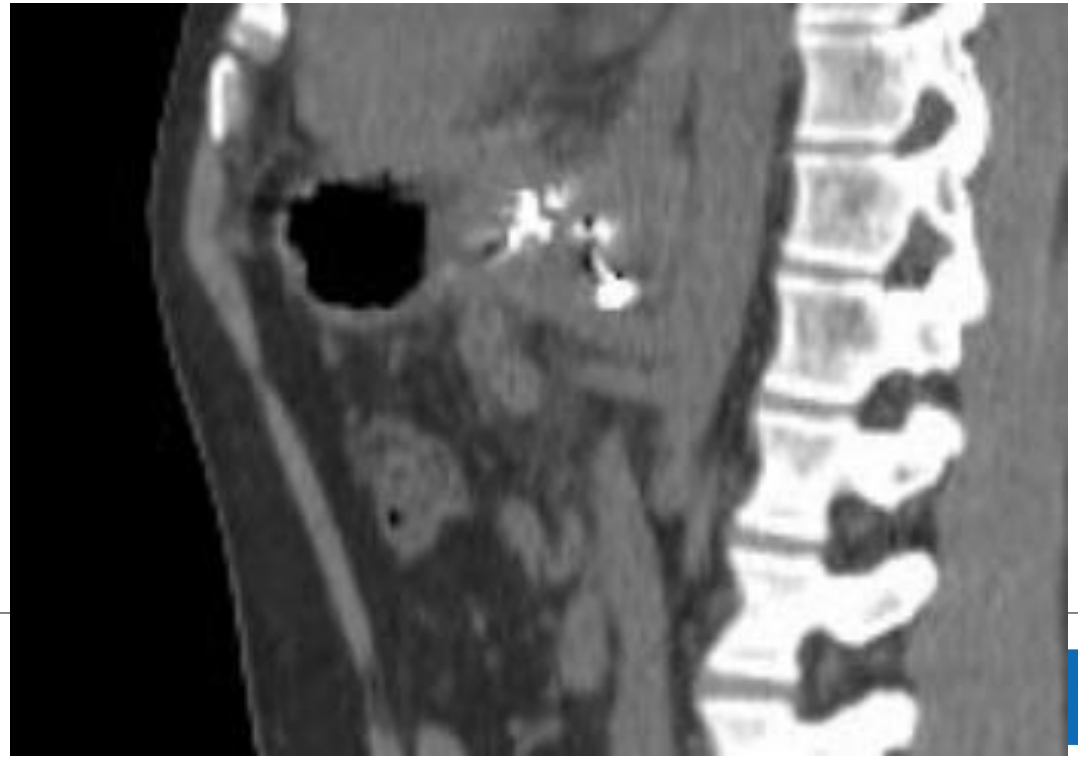
T4b Celiac axis

- 38M
  - Recurrence 2023





T4b Celiac axis

- 38M
  - CROSS regimen
  - Still encasing celiac artery; referred to UHN
  - Palliate vs surgery?
  - Is an R0 possible?

T4b Celiac axis

- 38M
  - CROSS regimen
  - Still encasing celiac artery; referred to UHN
  - Palliate vs surgery?
  - Total gastrectomy, distal pancreatectomy, splenectomy, Spiegel lobectomy
  - Common hepatic artery resection, celiac artery resection
  - Jump graft from aorta to hepatic artery proximal to GDA

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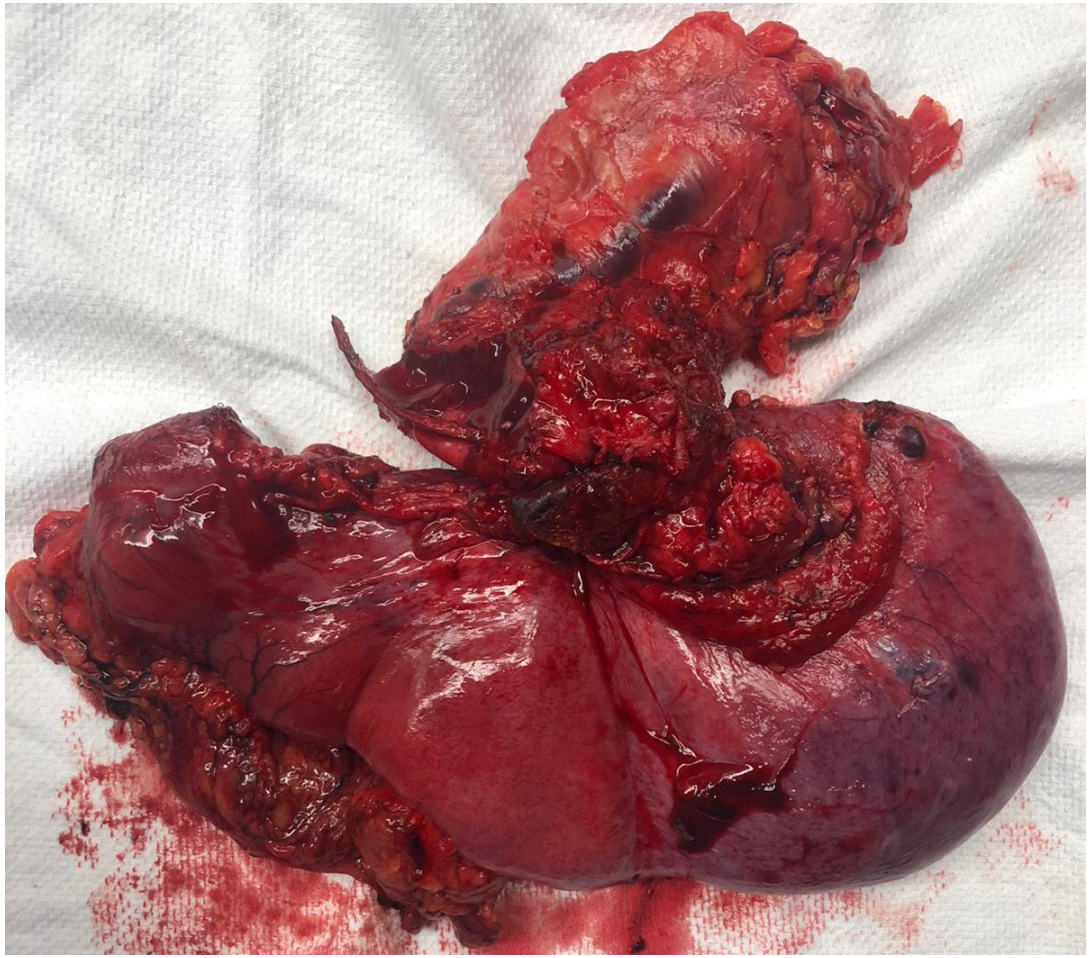
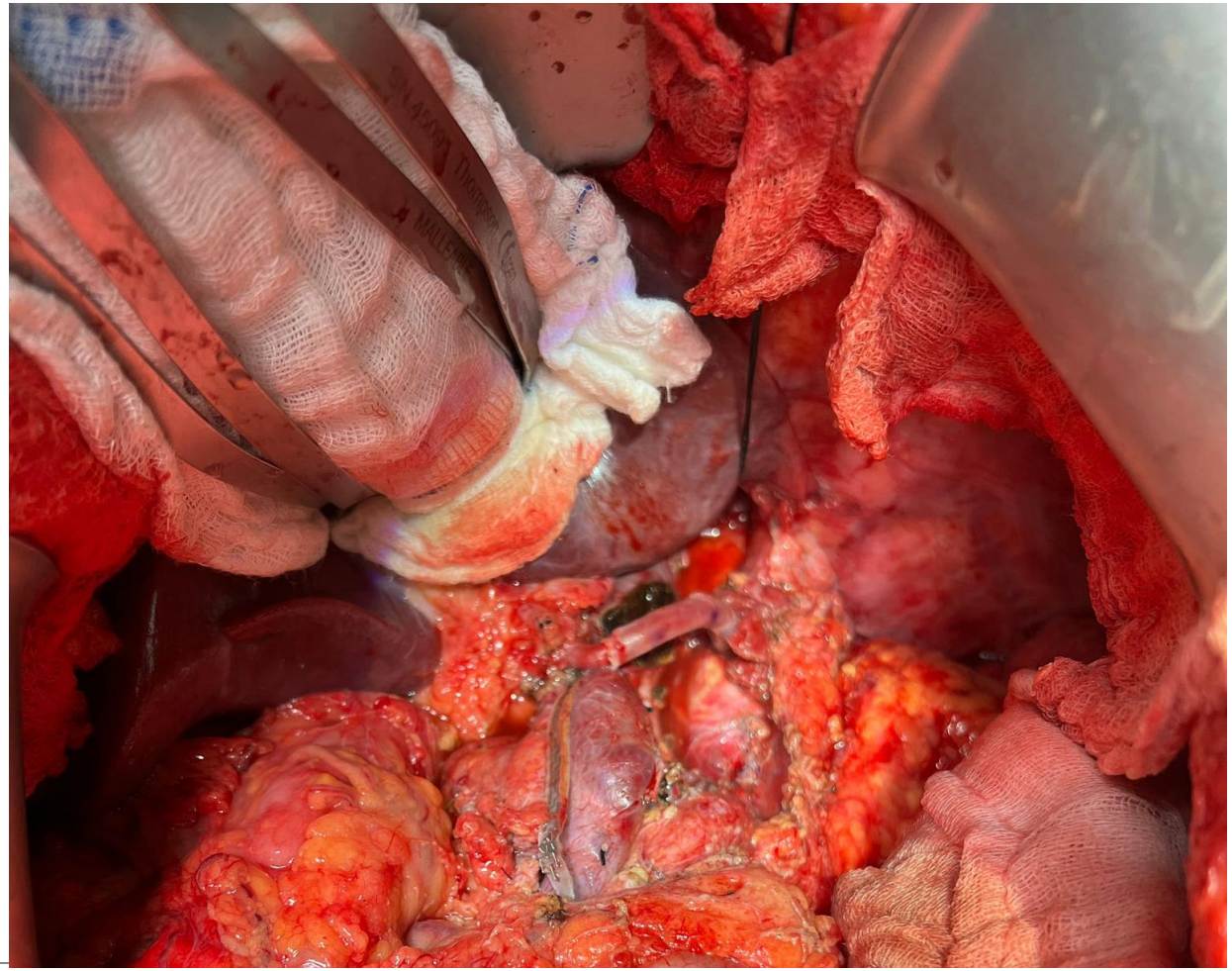
T4b Celiac axis





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T4b Celiac axis

MARGINS
Margin Status for Invasive Carcinoma: All margins negative for invasive carcinoma
Distance from Invasive Carcinoma to Closest Margin:
0.4 cm
Margin Status for Dysplasia and Intestinal Metaplasia:
All margins negative for dysplasia
REGIONAL LYMPH NODES
Regional Lymph Node Status: Tumor present in regional lymph node(s)
Number of Lymph Nodes with Tumor: 3
Number of Lymph Nodes Examined: 32
PATHOLOGIC STAGE CLASSIFICATION (pTNM, AJCC 8th Edition)
TNM Descriptors: y (post-treatment)
pT Category: pT4b
pN Category: pN2
ADDITIONAL FINDINGS
Additional Findings: None identified

6 mo post-op, adjuvant chemo

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T4b Aortic resection

- Similar problem as TEF
- Risk of AEF
- Chemorads may increase risk of AEF

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T4b Aortic resection

- Cong et al. Ann Thorac Surg 2014

- N=47 over 11 years (2001 – 2012)
- All SCC

- All resected with R0
- Invasion
  - 80.9% Adventitia
  - 19.1% Media

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T4b Aortic resection

- 6th interspace left thoracotomy
- Mobilization of esophagus
- Mobilization of intercostal arteries
- 1mg/kg Heparin IV
- Aortic crossclamp above and below invasion, resection, and reconstruction with PTFE graft
- Crossclamp time of 17+/3.2 minutes

Cong et al. Ann Thorac Surg 2014

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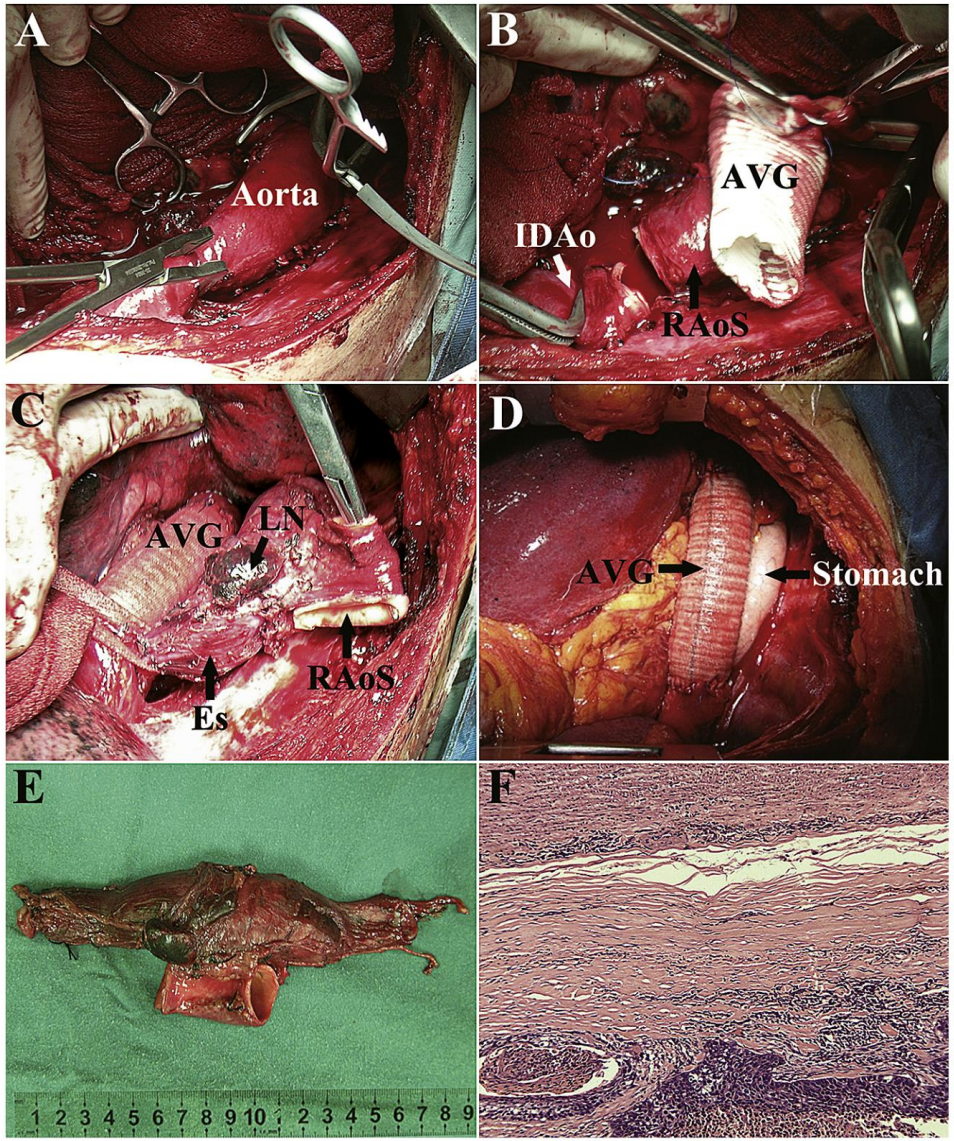
T4b Aortic resection



Cong et al. Ann Thorac Surg 2014

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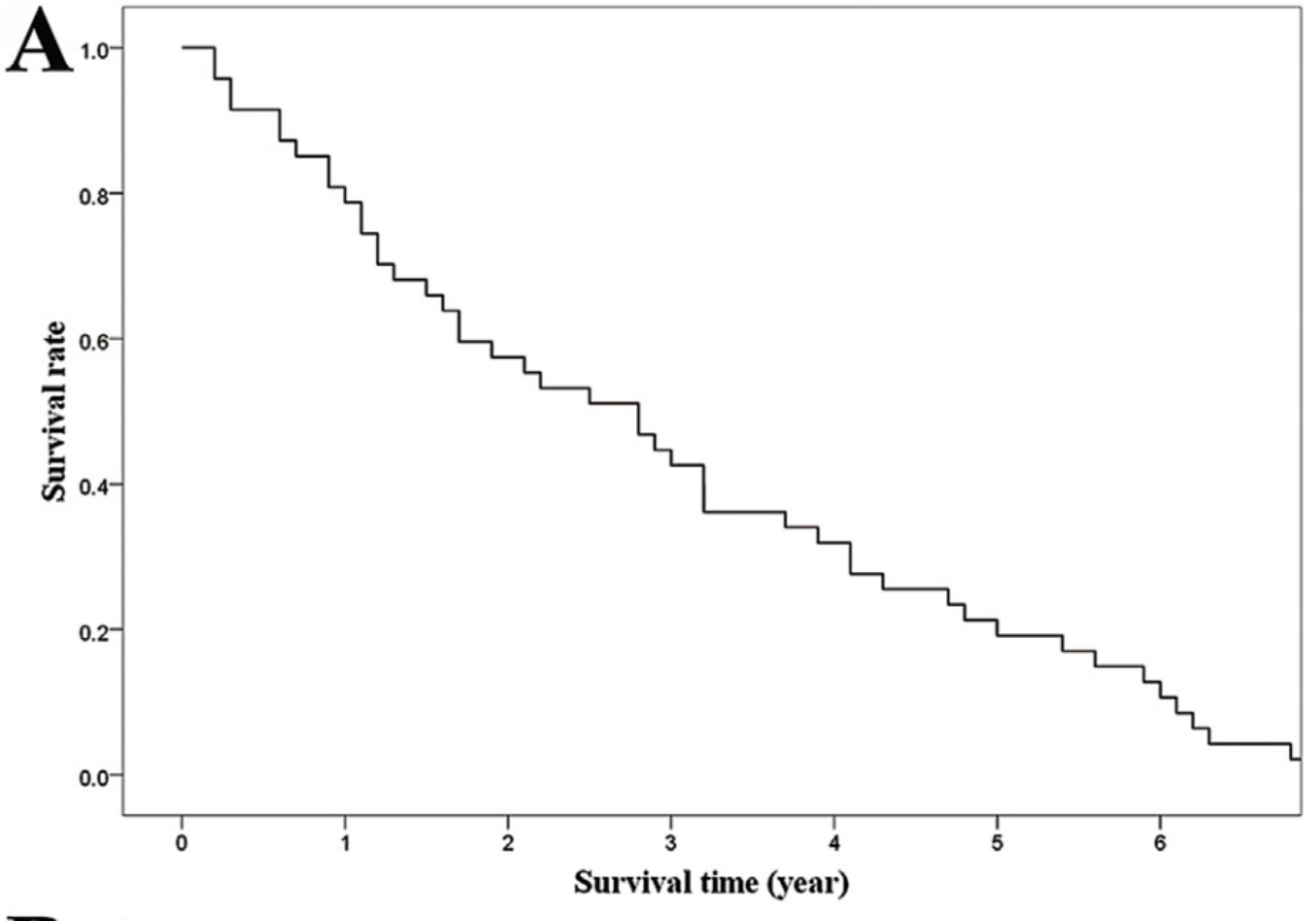
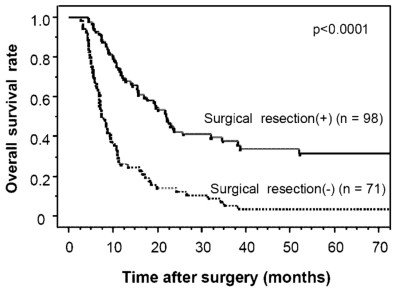
T4b Aortic resection

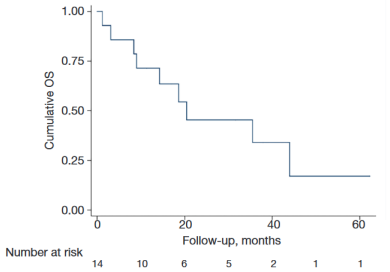


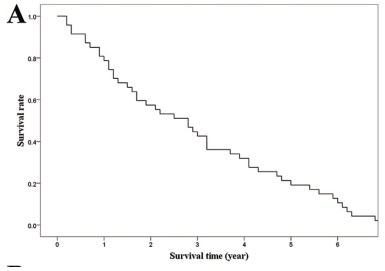
Cong et al. Ann Thorac Surg 2014

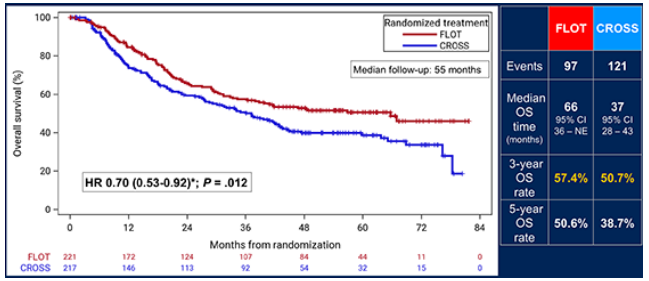
Conclusions

- It's technically achievable
  - Multi-team effort
  - Appetite for complications, multidisciplinary support for post-operative management
- Survival curves are poor, but needs to be put in context





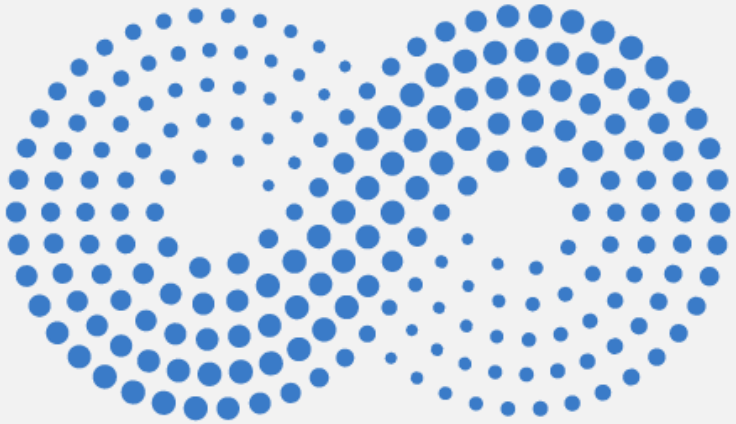




- (Neo-)Adjuvant therapies may improve

Conclusions

- Too much or fair game?
  - **Surgeons to decide**
  - Consider fitness, patient motivation, biology, neo-adjuvant options, adjuvant options…
  - “Not generalizable”
- Experienced surgeons need to be involved in the evaluation of all esophageal cancer patients
  - T4b
  - Oligometastatic disease



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Thank you

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