

INTRODUCTION:

- 18% of motor dysphagias haven't a clear anatomic pathologic base
- The anatomic-pathological mechanism that explains the correlation between asthma and reflux is not clear
- Un alteration of the connective tissue, in the posterior part of the esophagus, as consequence of vertebral surgery, often generate dysphagia
- Some Authors support the association between alteration of the connective tissues around the esophagus, at the level of the diaphragm, and the generation of hiatal hernia.

MACROSCOPIC ANATOMY

“the esophagus, as the trachea and the pharynx, is separated from the around organs through a layer of loose connective tissue”

(Testut, 1967)

“the esophagus is surrounded only by loose connective tissue”

(Gray, 2001; Azzali, 1995)

HISTOLOGY

adventitia

Smooth muscle longitudinal layer

Smooth muscle circular layer

Tunica media

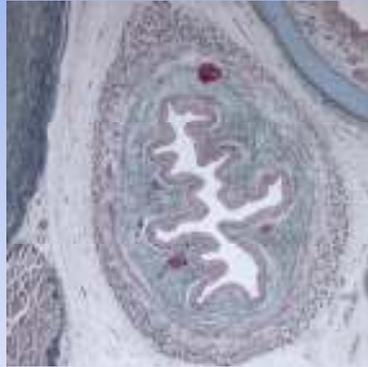
Muscularis mucosae

Tunica intima

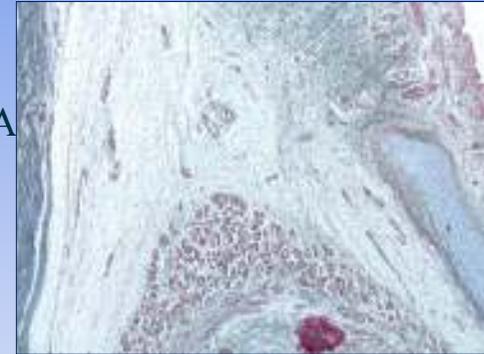
TUNICA ADVENTITIA

“... it is composed by loose connective tissue that connect the esophagus with the surrounding structures.”
(Gray, 2001)

“...include a rich component of elastic tissue”
(Balboni, 1994)



TUNICA ADVENTITIA



“In the thorax, the esophagus is surrounded by a fascia that condense itself around its until it forms a structure like a serosa. ... in the superior mediastin, the esophagus is keep in place thanks this fascial tissue that form a sort of serosa around the surrounding structure”
(Netter, 1983)

ESOPHAGUS AND PREVERTEBRAL FASCIA

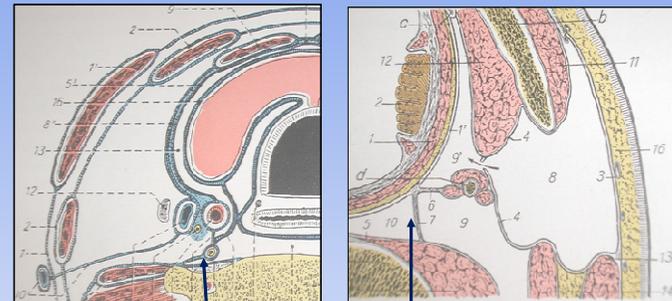
“the esophagus is adjust over the vertebrae, with the interposition of the pre-vertebral fascia from which it is separated by a layer of loose connective tissue”

“The loose connective tissue that fill the retroperitoneal space of the neck permit the peristaltic mechanism of the esophagus”
(Munari, 1976).

(Anastasi, 2007; Gray, 1994; Munari, 1976; Chiarugi, 1975; Rouvière, 1974; Bairati, 1977).



PREVERTEBRAL FASCIA



Testut 1966

esophagus sagittal septas

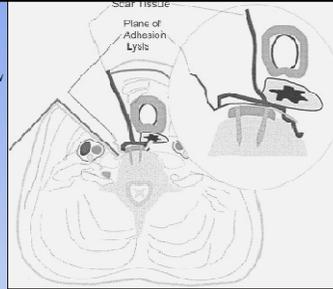
Testut 1964

“Two fibrotic laminae, one on the right and one on the left, that start from the sides of the esophagus, go behind and merge in the pre-vertebral aponevrosis ... generate the lateral parts of the retro-esophageous space ” (Testut, 1964)

ADHERENCES WITH THE PREVERTEBRAL FASCIA

“Surgery in the cervical spines cause frequently dysphagia”

a 1 month \Rightarrow 50%,
a 1 year \Rightarrow 12,5%



... it is explained with a neurological damage only in the 1.3% of such dysphagia” (Bazaz et al., 2002)

“...some persistent dysphagias (more then 18 months) are generated by adherences between the esophageal adventitia and pre-vertebral fascia. The surgical release of the adherences resolve the problem:

improvement of the dysphagia \Rightarrow 32%
complete resolution \Rightarrow 55%. (Fogel et al. 2005)

CONNECTIONS WITH THE TRACHEA

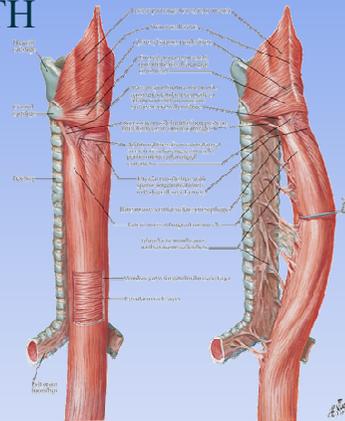


“The esophagus is in relation with the membranes surface of the trachea thanks the interposition of loose connective tissue” (Gray, 1994; Cunningham, 1964)

CONNECTIONS WITH THE TRACHEA

“the thoracic position of the esophagus is in relation in front with the membranous wall of the trachea, where the esophagus is strong connected through fibro-elastic septa with some muscular fibres”

(Netter, 2007)



“it generates a real muscle call **tracheas-esophagus muscle**”

(Balboni et al., 1994)

ESOHAGITIS FROM REFLUX AND ASTHMA

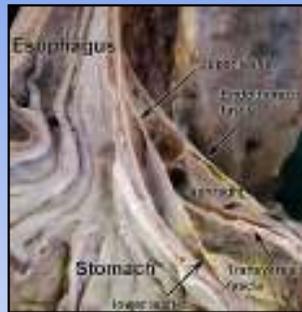
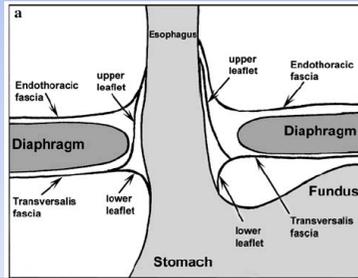
“there is a strong association between esophagitis from reflux and asthma, but the exact mechanism of generation is unclear” (Sugawa et al, 2008)



PHRENO-ESOPHAGEOUS LIGAMENT

Origin of the trasversalis fascia:

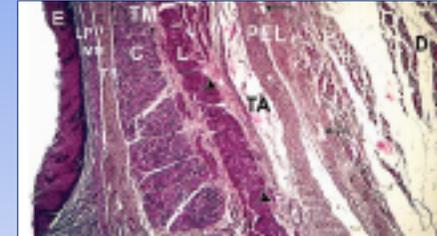
- superior layer
- inferior layer



The contribute of the endothoracic fascia "it is not visible macroscopically, but it is well demonstrable at the microscope" (Kwok et al., 1999)

PHRENO-ESOPHAGEOUS LIGAMENT

"The ascendant layer merge transversally, through multiple bundles of collagen fibres, at the esophagus" (Kwok et al., 1999)



arrow: insertion of the FEL at the muscular tunica

"The phreno-esophageous ligament merge deeply in the muscular tunica and insert strongly in the esophageal wall"

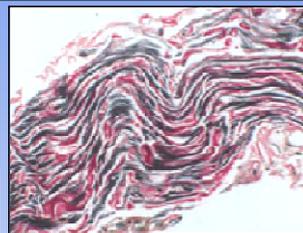
(Apaydin et al., 2008)

PHRENO-ESOPHAGEOUS LIGAMENT

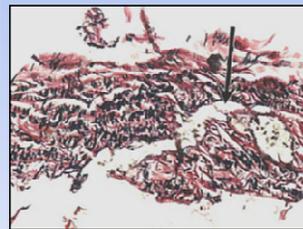
	Collagen F.	Elastic F.
Young	abundant	parallel
Elderly	few and thinner	disorganized

↓
decrease resistance at tension

↓
Increment incidence of ijatal hernia

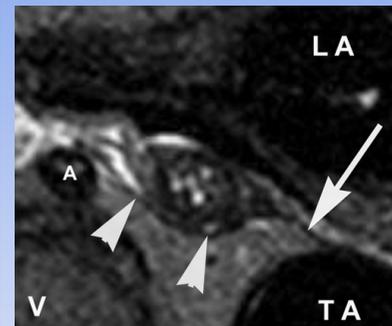


Young subject (Van Gieson)



Elderly subject (Van Gieson)

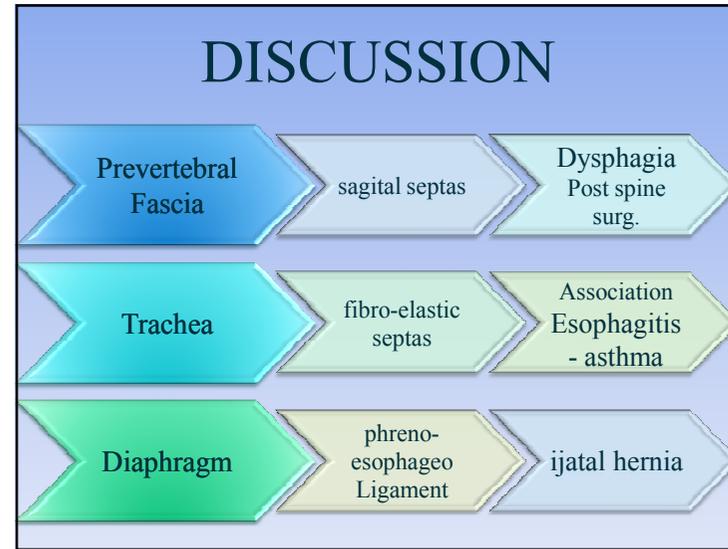
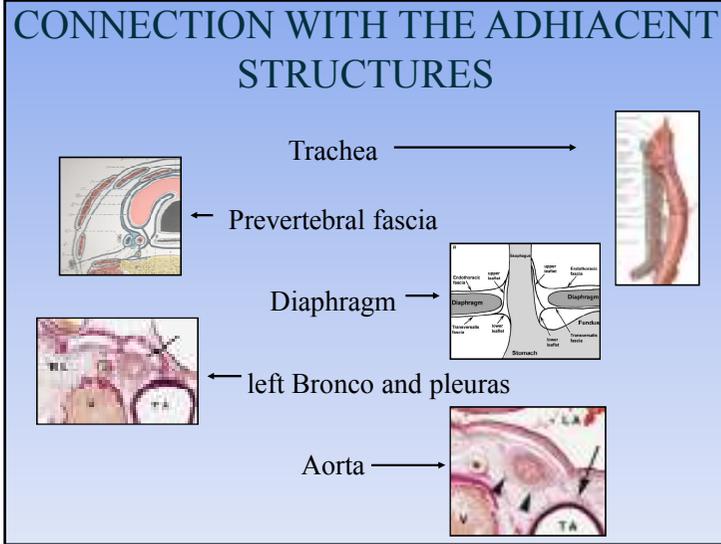
HIGH RESOLUTION RMN (T2)



Fascial plane (arrow) goes from the aortic adventitia, behind esophagus, until the right parietal pleura

" The HD RMN permit to define structures that were not precedent described , as the layer of connective tissue that connect the esophagus at the anterior wall of the aorta and the fascial plane that goes between the parietal pleura of right and left"

(Riddell et al. 2007)



CONCLUSION

AUTONOMY

↓

It is possible to apply at the esophagus the mechanism of SLIDING SYSTEM, already describe for the nerves, that across different structures.

DIPENDENCE

↓

It possible to hypotizide that the connection of the esophagus, with the surrounding organs through the adventitia, influence the distribution of the stress in the wall, modulating the esophagus peristalsis

PILOT STUDY: FMID for gastroesopha geal reflux disease (GERD)

Questionario GERD HRQL
Velanovich's GERD HRQL scale.

Scala	
0 =	assente/per nulla/no
1 =	presente ma non fastidioso
2 =	presente e fastidioso ma non ogni giorno
3 =	fastidioso ogni giorno
4 =	interferisce con le normali attivita' quotidiane
5 =	non consente la normale attivita' quotidiana

Quantitativo di valutazione della qualità di vita del paziente
Domande sul dolore
(controllare la risposta esatta)

	1	2	3	4	5
1) Quanto è intenso il dolore?					
2) Come si comporta il dolore in posizione sdraiata?					
3) Come si comporta il dolore in posizione eretta?					
4) Come si comporta il dolore dopo i pasti?					
5) Il dolore interferisce le tue attività giornaliere?					
6) Il dolore ti sveglia di notte?					
7) Hai difficoltà ad addormentarti?					
8) Hai difficoltà ad alzarti?					
9) Hai difficoltà a ripetere il tuo lavoro?					
10) Dovrei assumere farmaci 4 per te meno di 4 volte al giorno?					
11) Come ti senti?					
12) Come ti senti?					
13) Come ti senti?					
14) Come ti senti?					
15) Come ti senti?					

Velanovich V, Velanovich DR, Giar JR, Tapp PV, Harkness WH. J Am Coll Surg. 1990; 181(2): 217-24
1990; 181(2): 217-24

MATERIALS AND METHOD

- Mean duration of the pathology: 4 yy
- Mean frequency of the ingestion of the medicine: one every other day
- 56,25% of the patients have performed a esophagus-gastro- endoscopy

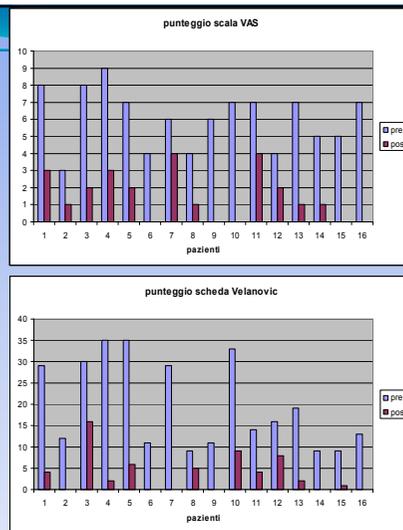
Total subjects: 16	
sex	5 m; 11 f
Mean age	42,8 yy (SD +/- 13.65 yy)

RESULTS

Percentage of the participants	symptoms
TIPICAL SYMPTOMS	
75%	acidity
62,5%	epigastria tension
68,75%	reflux
43,75%	pharynx "bolo"
ATIPICAL SYMPTOMS	
68,75%	pharynx irritation
62,5%	thoracic pain
37,5%	epigastria pain
37,5%	laryngitis
31,25%	chuff
31,25%	dysphonic problems

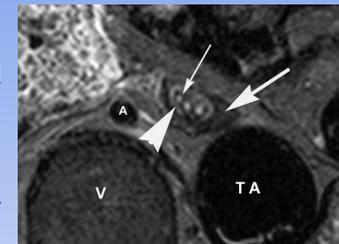
RESULTS

- Mean difference of the VAS value before and after treatment: 4,56
- Mean difference of the Velanovic scale before and after treatment: 16,06



CONCLUSIONS

The HD RMN could be a good instrument for analyze the surrounding connective tissue of the esophagus in the pathologies with alterations of esophagus motility



CONCLUSIONS

- FMID could be a new modality of treatment to decrease the GERD symptoms.

Thanks