IL RUOLO DELL'ENDOSCOPIA NELLA DIAGNOSI E NELLA CURA DELLE FORMAZIONI SOTTOMUCOSE DEL TRATTO GASTROENTERICO

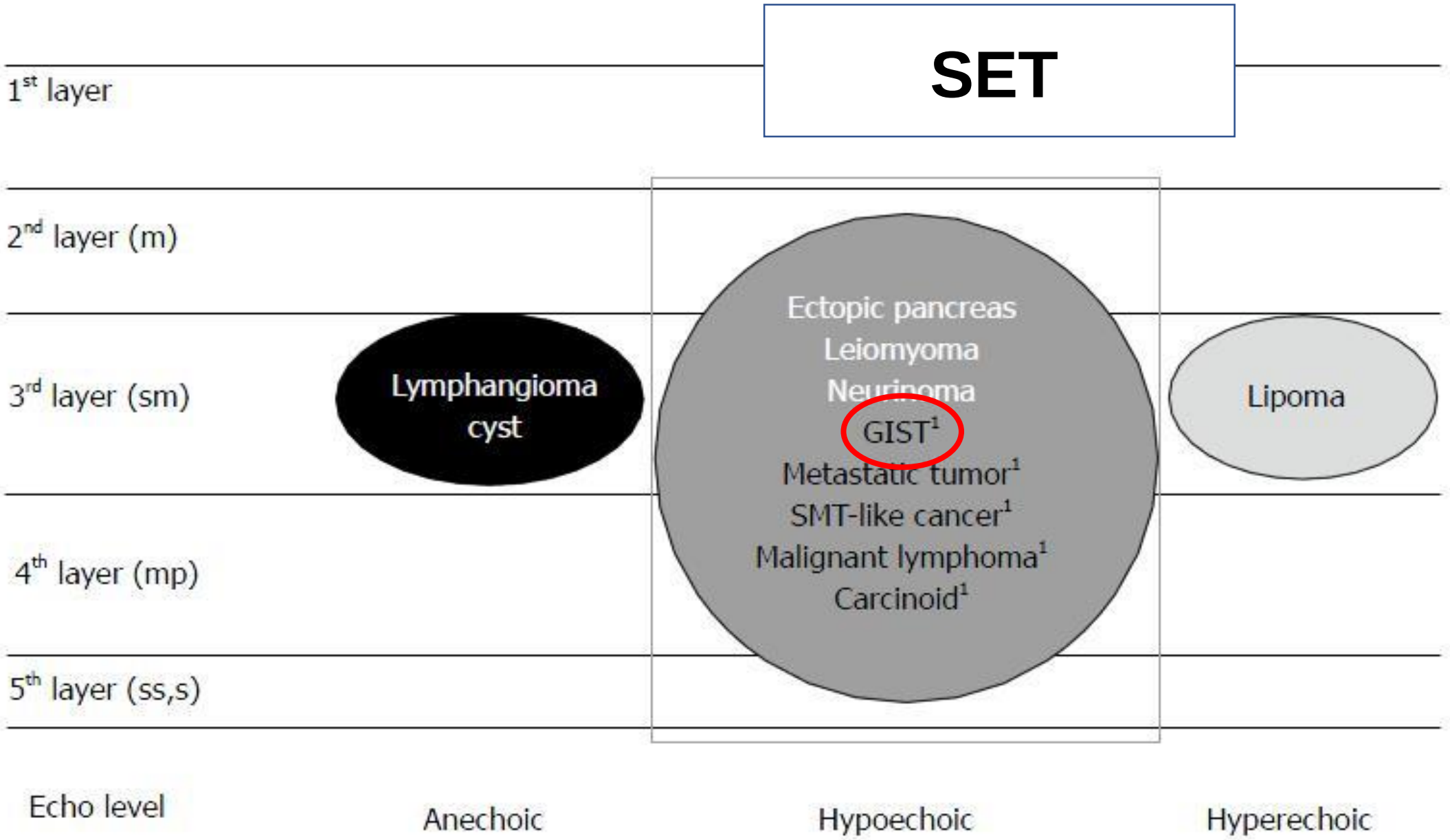
Dr. Nico Pagano
Policlinico Sant'Orsola
Bologna

SOTTOMUCOSE?

- **Termine non appropriato**
- **Sottoepiteliali (Sub Epithelial Tumors, SET)**
- **Più comprensivo**

ENDOSCOPIA NEI SET

- **IDENTIFICAZIONE**
- **CLASSIFICAZIONE**
- **TRATTAMENTO**


SET
1st layer
2nd layer (m)
3rd layer (sm)
4th layer (mp)
5th layer (ss,s)
Lymphangioma cyst
Ectopic pancreas
Leiomyoma
Neurinoma
GIST1
Metastatic tumor1
SMT-like cancer1
Malignant lymphoma1
Carcinoid1
Lipoma
Echo level
Anechoic
Hypoechoic
Hyperechoic

GIST VS NON GIST

- **DIAGNOSI PIU’ IMPORTANTE**
- **DIFFERENZA TRA TRATTAMENTO E NON TRATTAMENTO**
- **NON DIMENTICARE: NET E K SOTTOMINANTI**

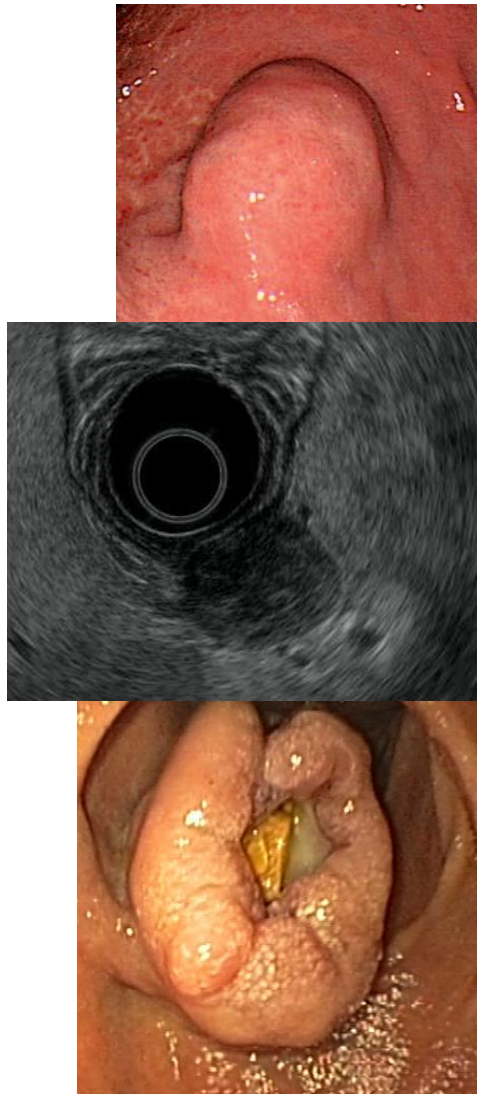
EUS

Morphology

- CH-EUS
- Elastography

Tissue acquisition

- EUS-guided
- Non EUS-guided



Endosonographic description of submucosal lesions

Description characters	
Lesion Diameter	Measured in two planmes
Layer of origin	If not possible to determine, describe its layer(s) of location
Echo-architecture	1. Structure: Solid/ cystic (vascular or non-vascular) / mixed solid-cystic 2. Echogenicity: Anechoic/ hypoechoic/ isoechoic/ hyperechoic 3. Texture: homogeneous/ inhomogeneous 4. Defined internal structures: echogenic areas/ anechoic areas/ calcifications
Margin	Well defined/ poorly defined/ breached at places
Covering wall layers	No mucosal defect/ulceration
Internal perfusion	On color coded duplex or power angiography
Other findings	Enlarged local or regional lymph nodes Relation with adjacent structures Any hepatic lesions Ascites

Is it possible to differentiate gastric GISTs from gastric leiomyomas by EUS?

Gwang Ha Kim, Do Youn Park, Suk Kim, Dae Hwan Kim, Dong Heon Kim, Cheol Woong Choi, Jeong Heo, Geun Am Song

WJG 2009

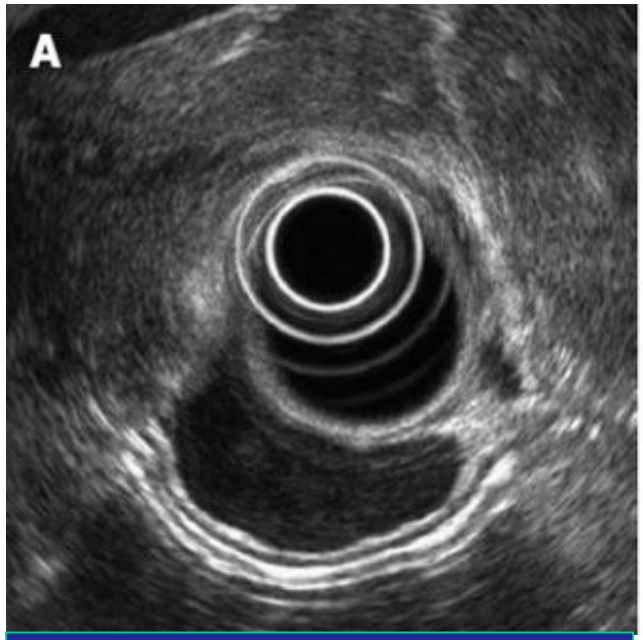
- 53 pt (7 leyomiomas and 46 GIST)
- 4 criteria
  - Inhomogenicity
  - Hypoecoic marginal halo
  - Higher echogenicity than muscle layer
  - Hyperechogenic spots
- At least 2 criteria: 89% Se – 87% Sp

EUS morphology of GIST

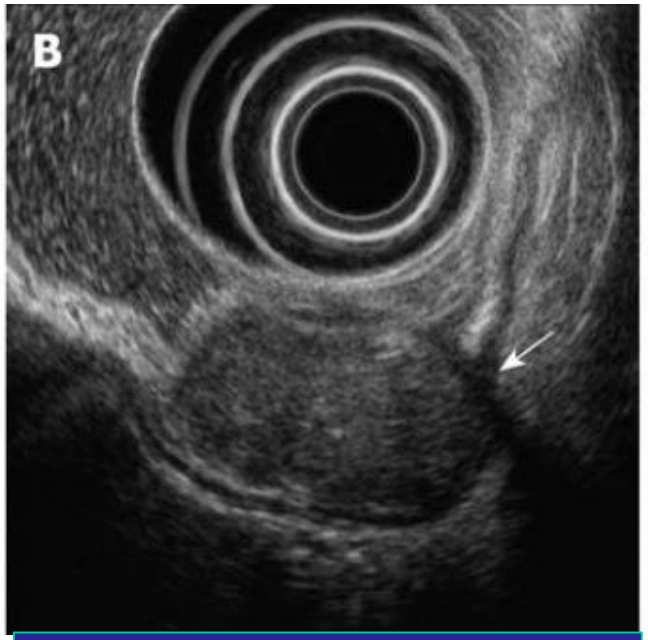
- Layer: IV (muscle)
- Rarely II (mm)
- (Irregular) margins with hypoechoic halo
- Hypoecoic (higher echogenicity than muscle layer)
- Pattern: (Homogeneous) Inhogeneous
- Hypercoic spots and cystic spaces

EUS criteria of malignancy

- Tumor size >4 cm
- Inhomogeneous echo pattern
- Irregular margins
- Cystic spaces
- Lymph nodes with a malignant pattern

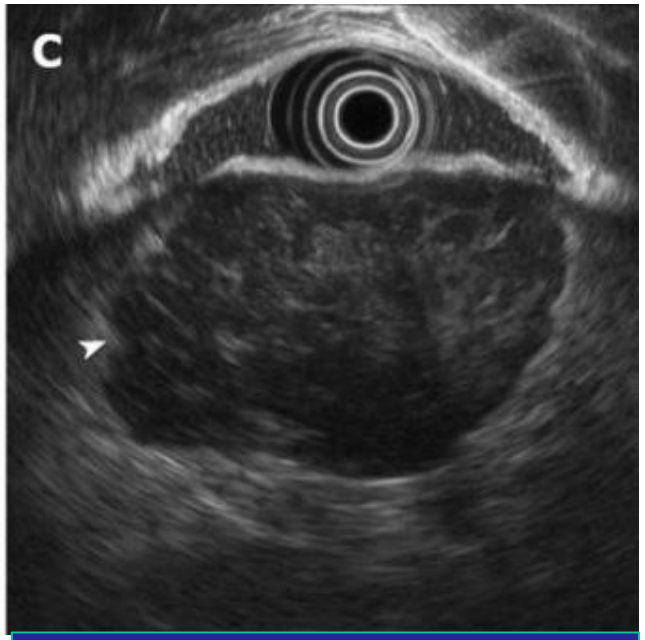


LEYOMIOMA



GIST

Low risk potential



GIST

High risk potential

CONTRAST ENHANCED EUS (CH-EUS)

Contrast-enhanced harmonic endoscopic ultrasound is able to discriminate benign submucosal lesions from gastrointestinal stromal tumors

- 17 gastroesophageal SELs
- 9 ↓↓ contrast enhancement ⇒ 4 LIPOMA 5 LEYOMIOMA
- 8 ↑↑ ⇒ GIST
- Sensitivity and specificity: 100%

(CE agent arrival and peak times: no diagnostic value)

Kannengiesser K. Scand J Gastroenterol 2012

ORIGINAL ARTICLE: Clinical Endoscopy

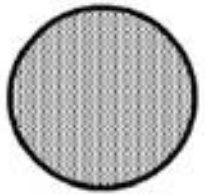
Estimation of malignant potential of GI stromal tumors by contrast-enhanced harmonic EUS (with videos)

Hiroki Sakamoto, MD, PhD, Masayuki Kitano, MD, PhD, Shigenaga Matsui, MD, PhD, Ken Kamata, MD, Takamitsu Komaki, MD, PhD, Hajime Imai, MD, Kensaku Dote, MD, Masatoshi Kudo, MD, PhD

Osaka-sayama, Japan

- 29 gastric GIST (6 leyomiomas,1 schwannoma)
- 2 criteria:
  - Intratumoral vessels
  - Enhancement

GIE 2011

Type	Vessel image	Perfusion image	
I (n = 8)			Low-grade malignancy GISTs:8
II (n = 21)			Low-grade malignancy GISTs:5 High-grade malignancy GISTs:16

Sensitivity: 100%

Specificity: 63%

Accuracy: 83%

TABLE 3. Ability of CEH-EUS to correctly determine the degree of GI stromal tumor malignancy

	Resected specimens		
CEH-EUS	Low-grade malignancy	High-grade malignancy	Total
Type I	8	0	8
Type II	5	16	21

CEH-EUS, Contrast-enhanced harmonic EUS.

The clinical impact of ultrasound contrast agents in EUS: a systematic review according to the levels of evidence

Pietro Fusaroli, MD,[1] Bertrand Napoleon, MD,[2] Rodica Gincul, MD,[2] Christine Lefort, MD,[2] Laurent Palazzo, MD,[3] Maxime Palazzo, MD,[3] Masayuki Kitano, MD,[4] Kosuke Minaga, MD,[4] Giancarlo Caletti, MD,[1] Andrea Lisotti, MD[1]

Bologna, Italy; Lyon, Paris, France; Osaka-Sayama, Japan

- Differential diagnosis of SELs
- Malignant potential of SELs

Key issues. Initial findings suggest that CH-EUS is promising in terms of differentiation between leiomyoma and GIST and for the risk stratification of GIST; however, further research in this field is warranted.

GIE 2016

ELASTOGRAPHY

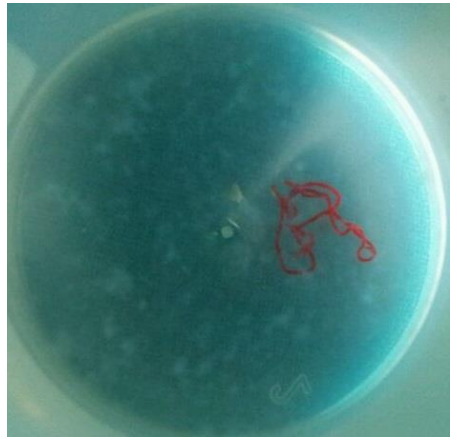
Diagnostic potential of endoscopic ultrasonography-elastography for gastric submucosal tumors: A pilot study

Yuichiro Tsuji,[1] Chika Kusano,[1] Takuji Gotoda,[1] Fumihide Itokawa,[1] Masakatsu Fukuzawa,[1] Atsushi Sofuni,[1] Jun Matsubayashi,[2] Toshitaka Nagao,[2] Takao Itoi[1] and Fuminori Moriyasu[1]

- EUS-EG helpful to differentiate GIST from other SMT
- Elastic score is not an objective score
- It cannot be use for qualitative diagnosis in individuals

TISSUE ACQUISITION

What we need?



- **FNA: POOR YIELD**
- **HISTOLOGY**
- **IMMUNOISTOCHEMISTRY**
- **MORE?**
  - **Mitotic count**
  - **Mutations**

FACTORS AFFECTING TISSUE YIELD

- **SIZE OF THE LESION**
- **SITE OF THE LESION**
- **NEEDLE TYPE**

SIZE OF THE LESION AND YIELD

- 44% <10 mm, 58% for 11-30 mm, 70% >30 mm

  (112 lesions) *Hoda 2009*
- 71% <20 mm, 86% for 20-40 mm, 100%>40 mm

  (53 lesions) *Akahoshi 2007*
- 73% ≤ 20 mm

  (90 lesions) *Akahoshi 2014*
- 82.5% for GIST of any size, 81.3% for GIST≤20 mm

  (84 lesions) *Sekine 2015*

SITE OF THE LESION: DIFFICULT LOCATIONS

- **LOWER THIRD OF THE STOMACH**

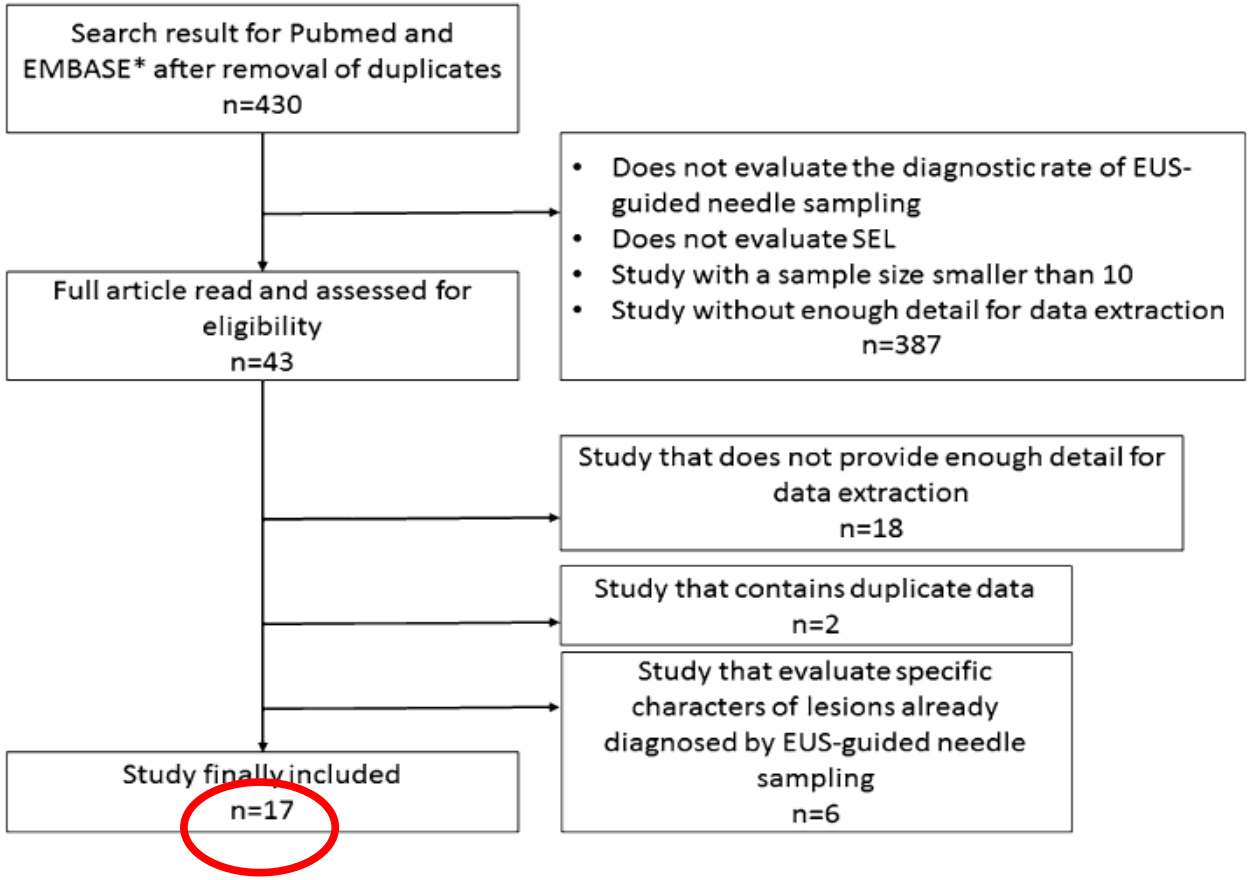
Suzuki T, ISRN Gastroenterol 2011

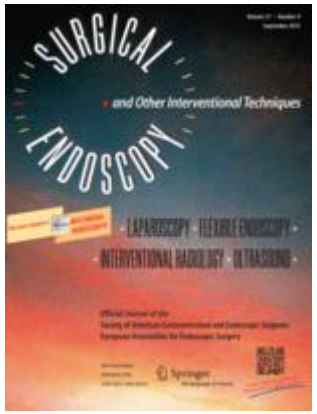
- **DUODENUM**

Sepe PS, Gastrointest Endosc 2009

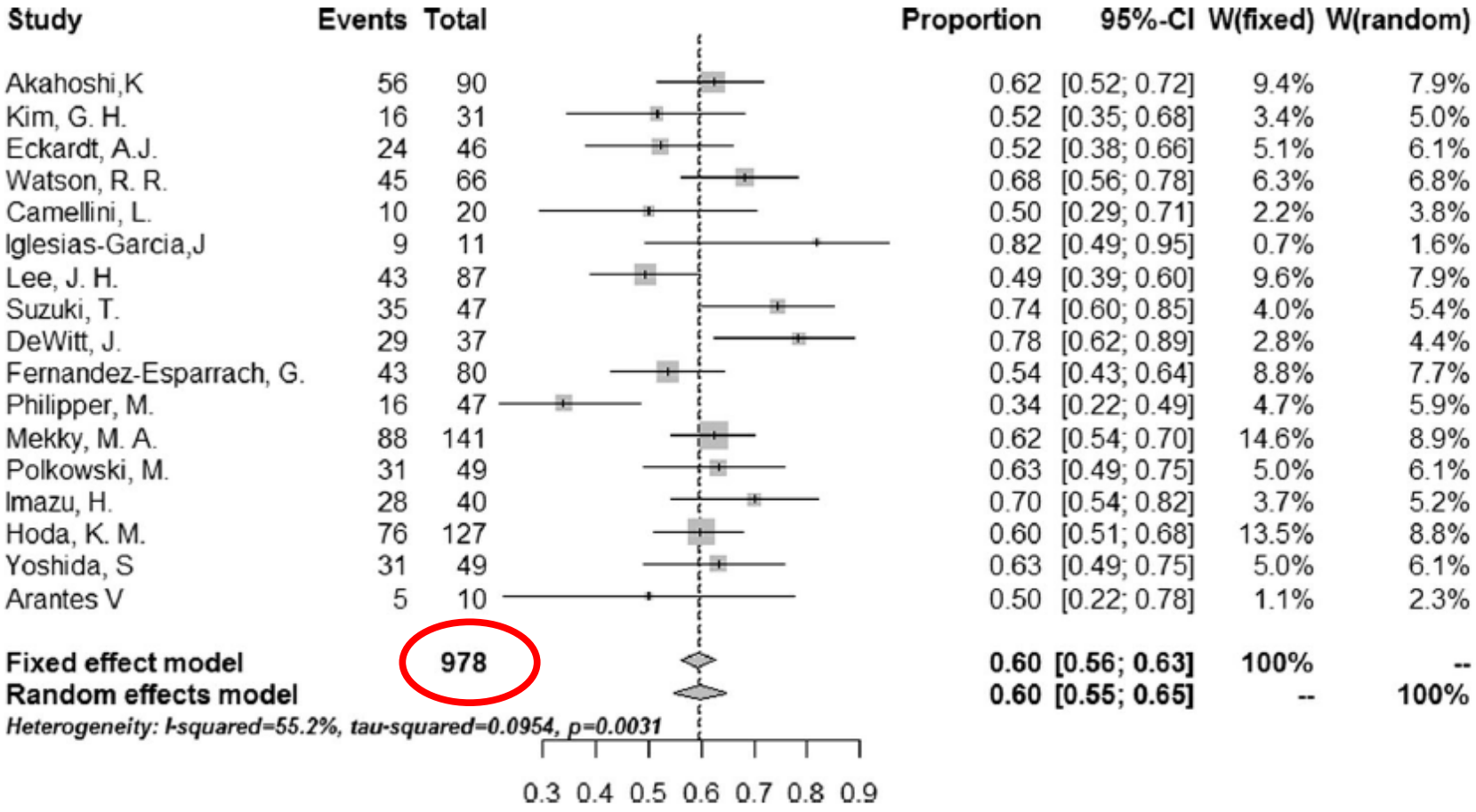
Diagnostic efficacy of endoscopic ultrasound-guided needle sampling for upper gastrointestinal subepithelial lesions: a meta-analysis

Xiao-Cen Zhang[1] · Quan-Lin Li[1] · Yong-Fu Yu[2] · Li-Qing Yao[1] · Mei-Dong Xu[1] · Yi-Qun Zhang[1] · Yun-Shi Zhong[1] · Wei-Feng Chen[1] · Ping-Hong Zhou[1]

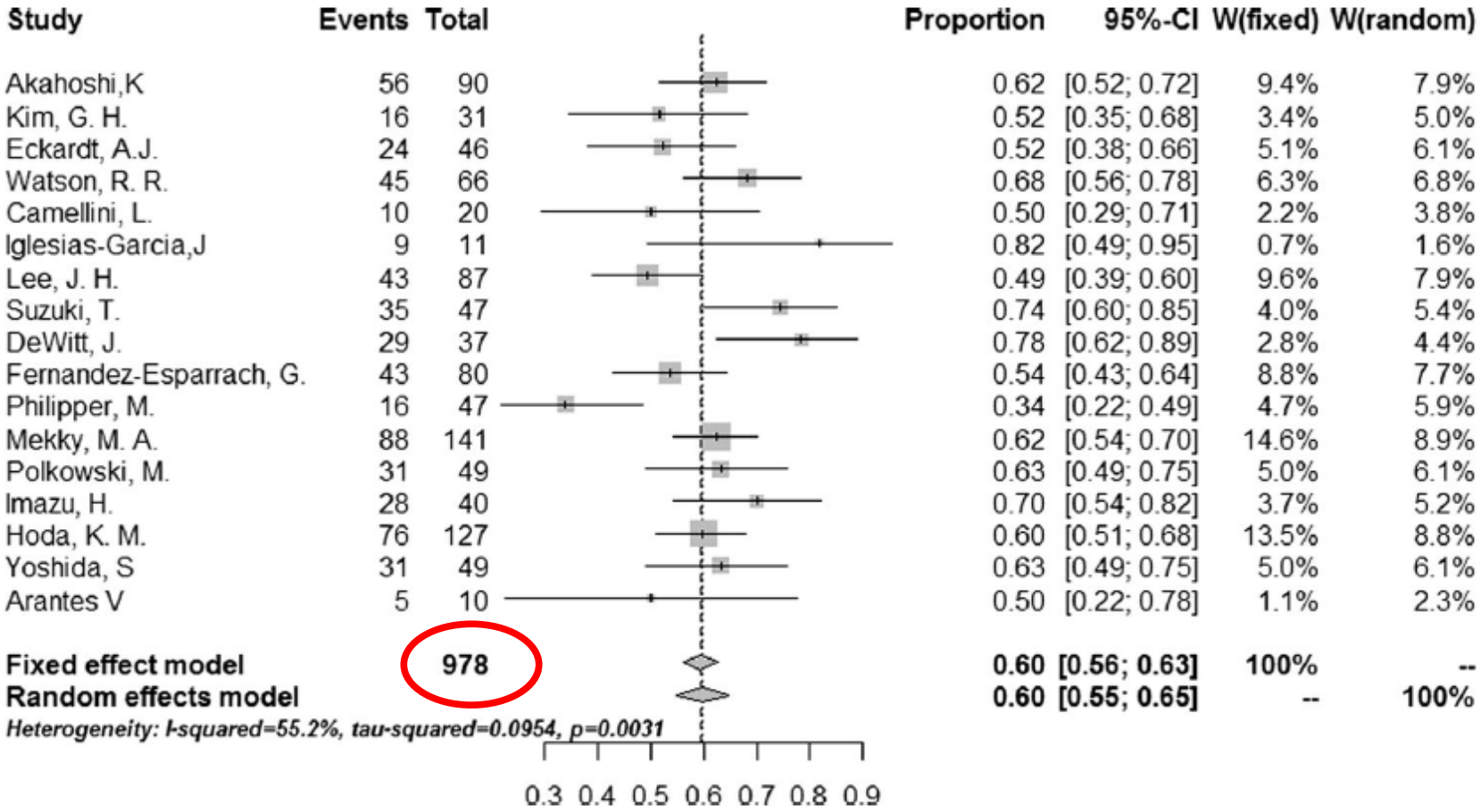




Surgical Endoscopy 2015



POOLED DIAGNOSTIC RATE: 59.9%



- 3 severe complications: sepsis (1 death)

- all with 19 needles (2 TCB, 1 FNA) and large tumors

Diagnostic efficacy of endoscopic ultrasound-guided needle sampling for upper gastrointestinal subepithelial lesions: a meta-analysis

Xiao-Cen Zhang[1] · Quan-Lin Li[1] · Yong-Fu Yu[2] · Li-Qing Yao[1] · Mei-Dong Xu[1] · Yi-Qun Zhang[1] · Yun-Shi Zhong[1] · Wei-Feng Chen[1] · Ping-Hong Zhou[1]

- EUS-FNA/B: safe, but only moderately effective
- FNA/TCB/FNB: No differences!!
- 19 G/22 G/25 G: No differences!!
- Only 2 studies with FNB
- Great heterogeneity among studies (cell-block, ROSE...)

EUS-FNB 2.0: NEW GENERATION NEEDLES

Comparison of FNA and fine-needle biopsy for EUS-guided sampling of suspected GI stromal tumors (CME)

Abdul Hamid El Chafic, MD, David Loren, MD, Ali Siddiqui, MD, Rawad Mounzer, MD, Natalie Cosgrove, MD, Thomas Kowalski, MD

Philadelphia, Pennsylvania, USA

Characteristics	All patients N = 106	Type of needle		*P* value
		FNA N = 91	FNB N = 15	
Needle size, gauge, no. (%)				.14
19		3 (3.5%)	1 (6.7%)	
22		77 (90.6%)	11 (73.3%)	
25		5 (5.9%)	3 (20.0%)	
No. of passes to obtain adequate tissue, median	2	3	1	.00
Adequate tissue on first pass	22 (34.9%)	12 (23.5%)	10 (83.3%)	
Correct preoperative diagnosis (N =44)		26 (76.5%)	10 (100.0%)	.42

GIE 2017

Su1319

Clinical and Pathologic Evaluation of a New Eus Core Biopsy Needle: A Large Multicenter Trial

Douglas G. Adler*[1], Linda J. Taylor[1], V. Raman Muthusamy[2], Gulshan Parasher[3], Nirav Thosani[4], Ann M. Chen[5], Jonathan M. Buscaglia[6], Harry R. Aslanian[7], Ali Siddiqui[8]

DDW 2017

- 200 lesions (34 subepithelial) / Overall diagnosis: 96%

Su1320

Prospective Assessment of the Performance of a New Fine Needle Biopsy Device at 2 Large Referral Centers

Mohammad Al-Haddad*[1], Kalpesh Patel[2], Mohamed O. Othman[2]

- 45 lesions (7 subepithelial)/ Overall diagnosis: 94%

Su1335

Experience With a Novel Eus-Guided Core Biopsy Needle (Acquire™): A Pilot Study

Bertrand Napoleon*[1], En-Ling Leung Ki[1,3], Anne-Isabelle Lemaistre[2], Fabien Fumex[1], Rodica Gincul[1], Christine Lefort[1], Dr Vincent Lépilliez[1], Bertrand Pujol[1]

- 46 lesions (6 subepithelial/wall thickening) / Overall diagnosis: “at least” 86%

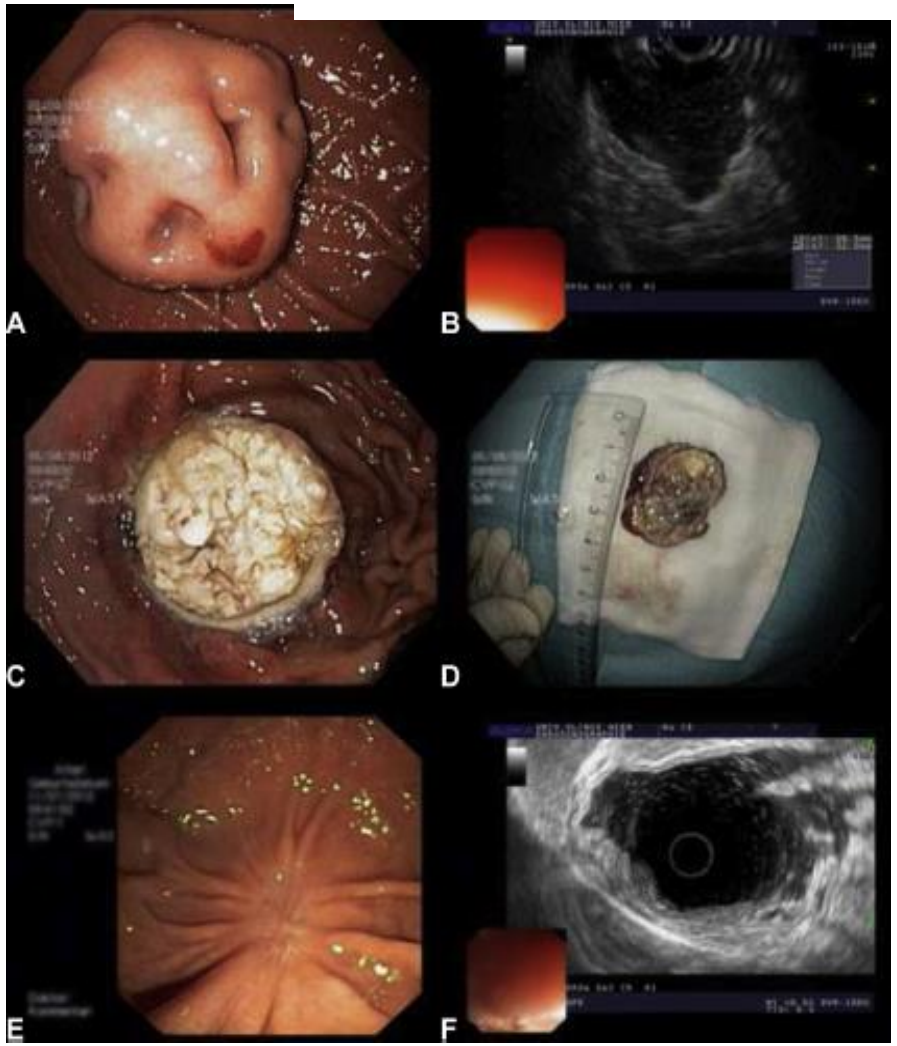
ALTERNATIVE METHODS OF TISSUE ACQUISITION

- **Bite-on-bite or “deep staked” (Ji JS, Korean J Intern Med 2009; GIE 2012)**
- **“Unroofing” technique (Mimura T, GIE 1997; Dolak W, GIE 2016)**
- **Mucosal incision assisted biopsy (MIAB) (Lee HL, GIE 2011; WJGE 2013)**
- **Suck-ligate-unroof-biopsy (SLUB) (Binmoeller KF, GIE 2014)**
- **Submuc. tunneling biopsy (STB) + muc. flap (SEMF) (Kobara H, End. 2012)**
- **EUS-Key Hole Biopsy (Grubel P. Endoscopy 2010)**
- **EUS-g. single-incision needle knife (EUS-SINK) (Serna-Higuera GIE 2011)**
- **“Canalization” technique (Abad-Belando R, Endosc Ultrasound 2017)**
- **Drill needle aspiration biopsy (Uesato M, Gastric Cancer 2017)**

A retrospective study on the safety, diagnostic yield, and therapeutic effects of endoscopic unroofing for small gastric subepithelial tumors

Werner Dolak, MD,[1,4] Andrea Beer, MD,[2,4] Ivan Kristo, MD,[3,4] Barbara Tribl, MD,[1,4] Reza Asari, MD,[3,4] Maximilian Schöniger-Hekele, MD,[1,4] Fritz Wrba, MD,[2,4] Sebastian F. Schoppmann, MD,[3,4] Michael Trauner, MD,[1,4] Andreas Püspök, MD[1,4]

Vienna, Austria



- 14 SETs (8 GISTs). 26 ± 13 mm
- 9 diagnosis *vs* 5 therapeutic intent
- Technically successful: 13/14 cases
- 4 intraprocedural bleeding (endoscopy)
- 6 GISTs+leiomyoma: complete regression
- Not oncologically curative: pts unfit for surgery

GIE 2016

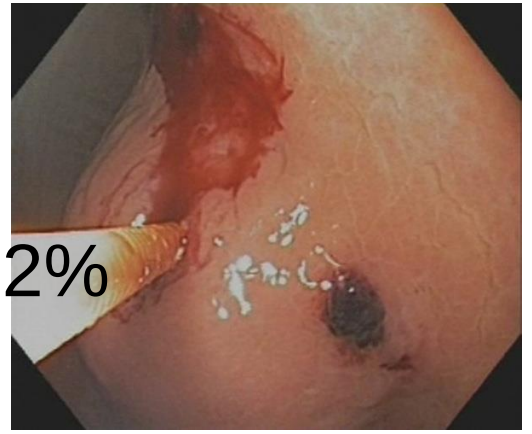
EUS-guided single-incision needle-knife biopsy: description and results of a new method for tissue sampling of subepithelial GI tumors (with video)

Carlos de la Serna-Higuera, MD,[1] Manuel Pérez-Miranda, MD,[1] Pilar Díez-Redondo, MD,[1] Paula Gil-Simón, MD,[1] Teresa Herranz, MD,[1] Elena Pérez-Martín, MD,[2] C. Ochoa, MD,[3] Agustín Caro-Patón, MD[1]

Valladolid, Spain

GIE 2011

Efficacy of single-incision needle-knife biopsy for sampling subepithelial lesions



Authors

Yuto Shimamura[1], Jason Hwang[1,2], Maria Cirocco[1], Gary R. May[1], Jeffrey Mosko[1], Christopher W. Teshima[1]

EIO 2017

- 14 + 49 pts: diagnostic accuracy 86-92%

Endoscopically visualized features of gastric submucosal tumors on submucosal endoscopy

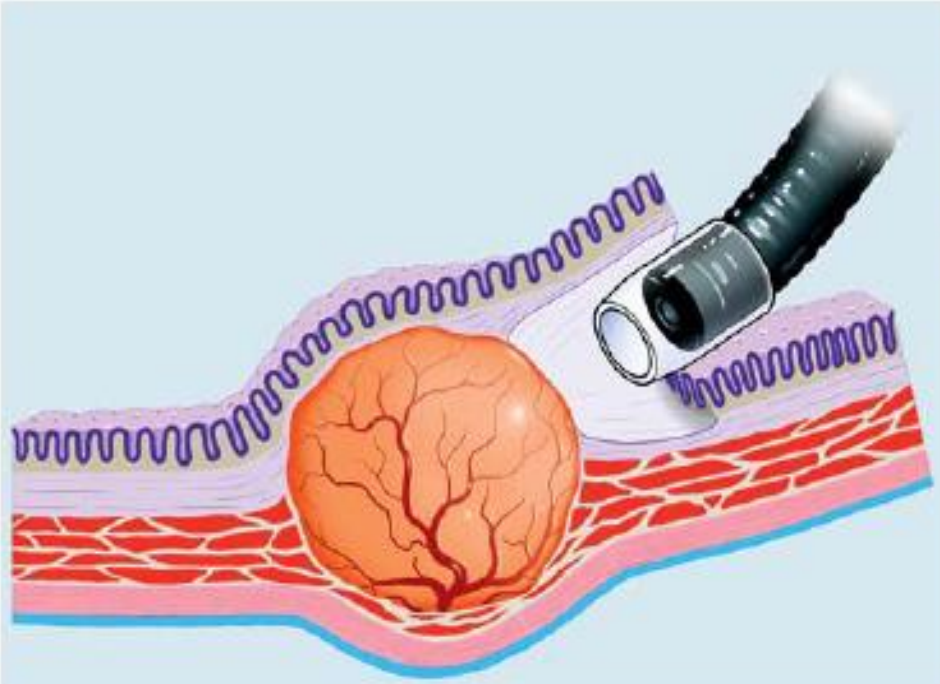


Fig. 1 Bloc biopsy with the submucosal endoscopy mucosal flap method. A short tunnel is created, via an additional submucosal dissection, to access the tumor. The endoscopically visualized features of the submucosal tumor can be identified in the submucosa.

Fig. 2 Gastrointestinal stromal tumor (GIST) characteristics at submucosal endoscopy: typically white, cloudy, round, rigid tumors.

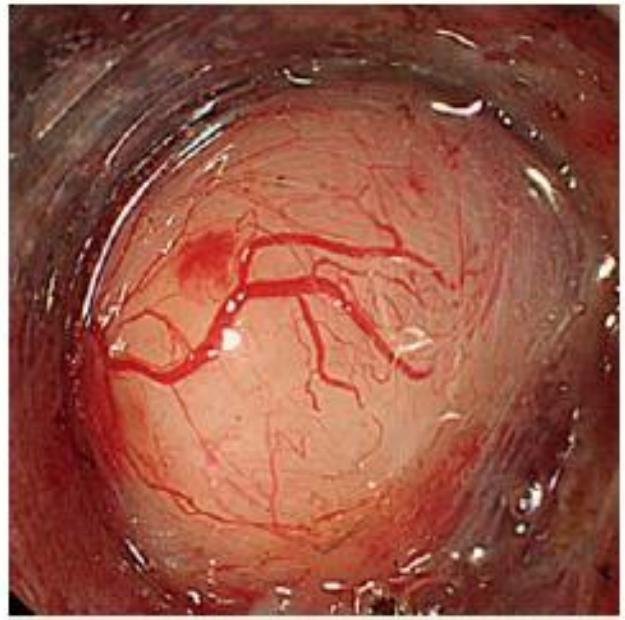


Fig. 3 Leiomyoma characteristics at submucosal endoscopy: typically white, clear, round, elastic but hard tumors.

Submucosal tunneling biopsy (STB) with mucosal flap (SEMF)

(Kobara H, Endoscopy 2012)

Endoscopic Incisional Technique for Histological Diagnosis of Gastric Subepithelial Lesions following EUS Evaluation

SETs of the fourth layer at EUS examination

Pagano N.

Gastroenterology Unit, S. Orsola-Malpighi University Hospital, Bologna, Italy

Number of patients	32
Age (years) (range)	56 (18-70)
Sex(M/F)	20/12
Location of the lession Cardia Fundus Body Antrum	 2 2 16 12
Size of the lesions (mean, mm) (range)	19 (18-24)
Procedure time (mean, minutes) (range)	19 (16-32)
Number of biopsies (mean) (range)	4 (3-7)
Advers events	1 (ulceration)
Pathological diagnosis Gastrointestinal stromal tumors Leiomyoma Nondiagnostic	 20 10 2
Treatment Observation Surgical resection	 10 22
Follow-up (mean, months) (range)	6 (3-9)

Int Gast Hepatol, 1(1): 07-11 (2018)

Prospective Study

Histological diagnosis of gastric submucosal tumors: A pilot study of endoscopic ultrasonography-guided fine-needle aspiration biopsy *vs* mucosal cutting biopsy

Table 2 Diagnostic yields obtained with endoscopic ultrasonography-guided fine-needle aspiration biopsy and mucosal cutting biopsy

	EUS-FNAB				*P* value	MCB				*P* value
	Diagnosed (%) (*n* = 13)		Not diagnosed (%) (*n* = 7)			Diagnosed (%) (*n* = 12)		Not diagnosed (%) (*n* = 8)		
Histological diagnosis	13 (65.0)					12 (60.0)				> 0.99
Location 1										
Upper	7	(63.6)	4	(36.4)	0.33	8	(72.7)	3	(27.3)	0.28
Middle	6	(75.0)	2	(25.0)		4	(50.0)	4	(50.0)	
Lower	0	(0)	1	(100)		0	(0)	1	(100)	
Location 2										
Lesser curvature	4	(66.7)	2	(33.3)	0.81	3	(50.0)	3	(50.0)	0.27
Greater curvature	2	(50.0)	2	(50.0)		1	(25.0)	3	(75.0)	
Anterior wall	4	(80.0)	1	(20.0)		4	(80.0)	1	(20.0)	
Posterior wall	3	(60.0)	2	(40.0)		4	(80.0)	1	(20.0)	
Tumor size										
≤ 20 mm	7	(58.3)[a]	5	(41.7)	0.64[1]	9	(75.0)[a]	3	(25.0)	0.17[1]
> 20 mm	6	(75.0)[c]	2	(25.0)		3	(37.5)[c]	5	(62.5)	
Growth pattern										
Intraluminal	9	(56.3)[e]	7	(43.8)	0.10[1]	12	(75.0)[e]	4	(25.0)	0.01[1]
Extraluminal	4	(100)[b]	0	(0)		0	(0)[b]	4	(100)	
Median number of samples to the diagnosis (IQR)	1.0	(1.0, 1.0)				1.0	(1.0, 1.75)			
Median number of samples (IQR)	3.0	(2.5, 3.5)	3.0	(3.0, 3.0)	0.93	5.0	(3.0, 6.0)	2.5	(1.0, 5.75)	0.17

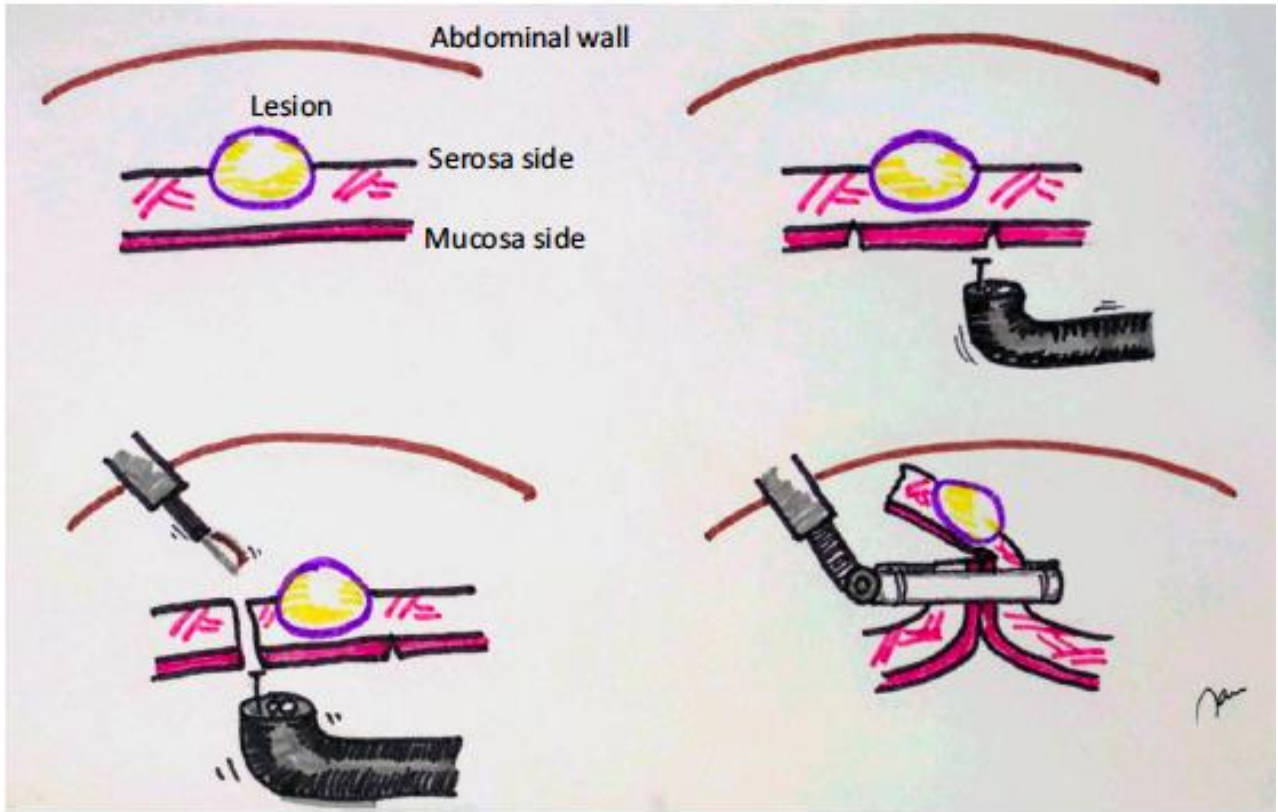
TREATMENT

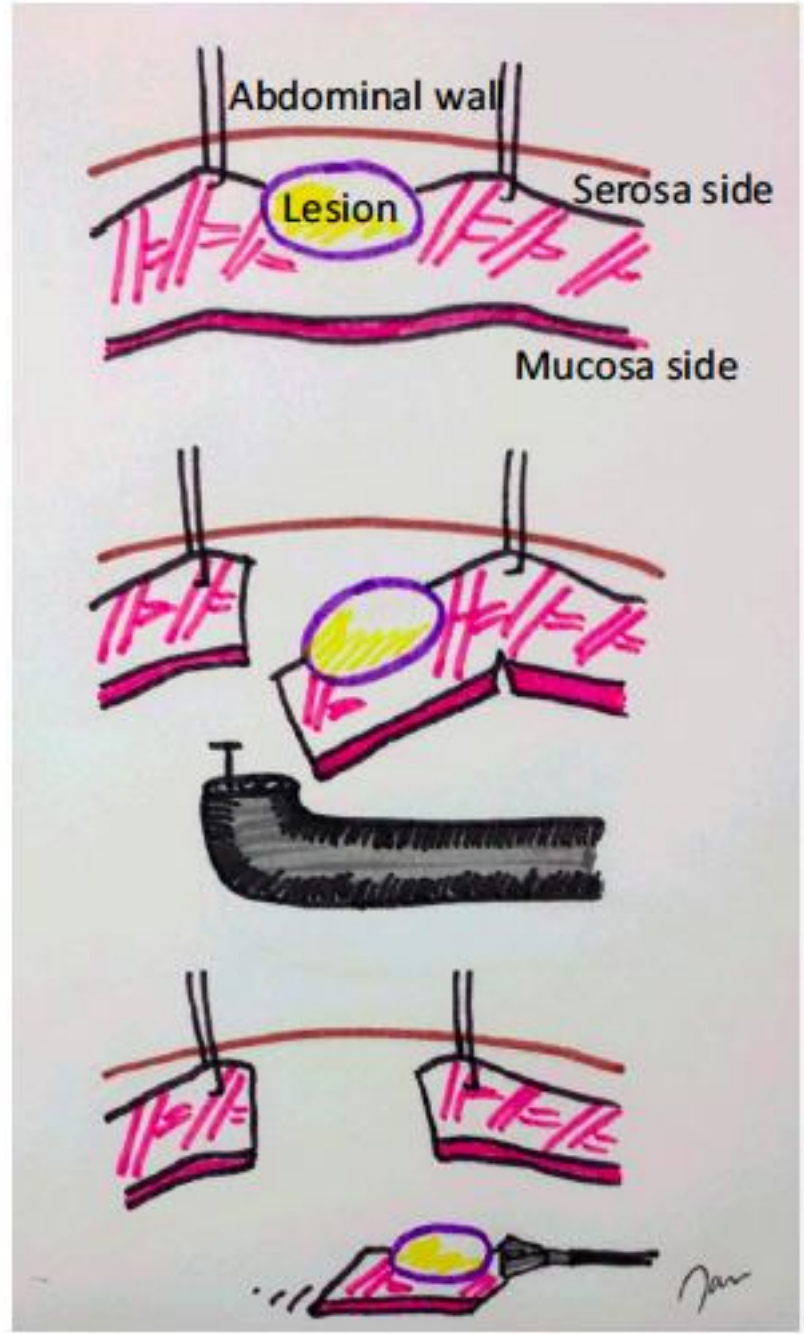
Curr Treat Options Gastro 2017

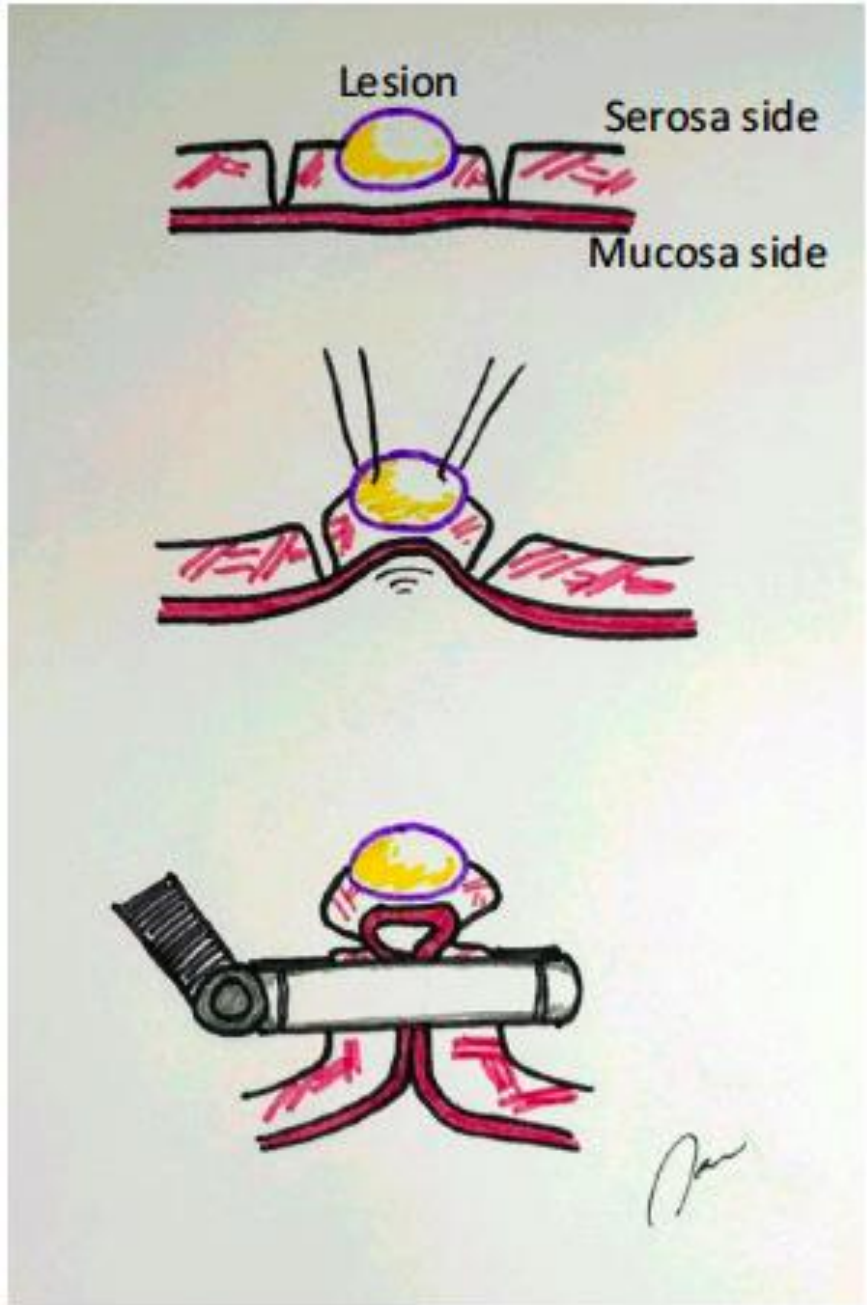
Summary of endoscopic techniques for resection of submucosal lesions

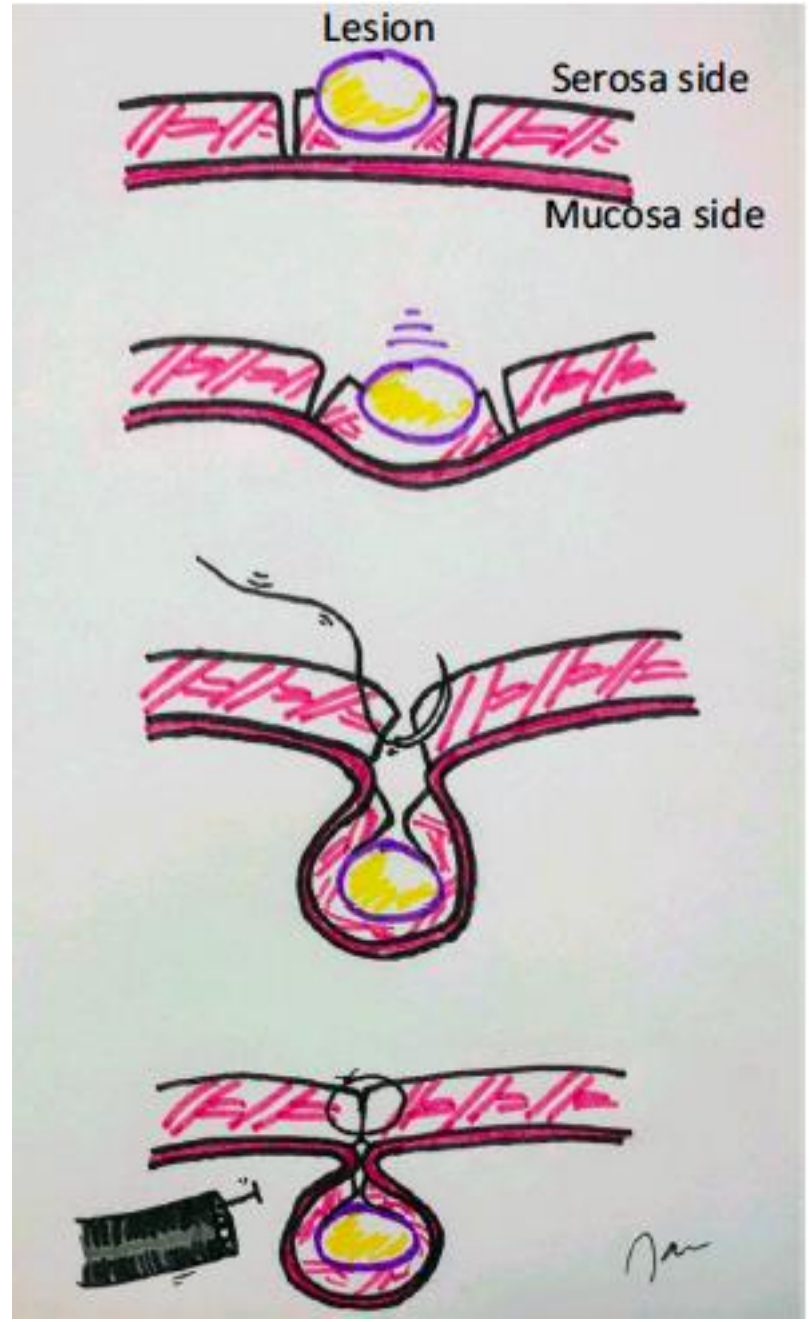
Technique	Generally recommended lesions	Pros	Cons
ESD (enucleation)	Size < 2 cm Located anywhere in the gastrointestinal tract No muscle involvement (or minimal for gastric lesions), to avoid full-thickness perforation	Purely endoscopic Endoscopic submucosal dissection skills are sufficient	Risk of direct perforation Not suitable for lesions with full muscle thickness involvement Lesion size limited by per-oral retrieval
STER/POET	Size < 4 cm Located in esophagus or stomach (lesser curvature, cardia, body, antrum) Intra-luminal	Purely endoscopic Minimizes direct extra-luminal contamination even in case of leakage Feasible with lesions with full muscle thickness involvement	Requires skills of submucosal tunneling technique Lesion size limited by per-oral retrieval Difficult for lesions located at fundus or high greater curvature
LECS	Size limited only by feasibility to close defect without anatomical disruption Located anywhere in the stomach	Quick incision around lesion with laparoscopic instruments Feasible for lesions of any shape or side of lumen involved	Requires laparoscopic surgical skills and skin incisions Intra-luminal exposure during procedure

Technique	Generally recommended lesions	Pros	Cons
Inverted LECS	Size < 4 cm Located anywhere in the stomach that can be brought near to the abdominal wall	Feasible for lesions of any shape or side of lumen involved Intra-luminal spillage more controlled compared to LECS	Requires laparoscopic surgical skills and skin incisions Intra-luminal exposure during procedure More difficult full-thickness incision Lesion size limited by per-oral retrieval
CLEAN-NET	No size limit Located anywhere in the stomach Extra-luminal	Avoids exposure of lumen throughout procedure	Requires laparoscopic surgical skills and skin incisions Not suitable for large intra-luminal lesions Laparoscopic stapling required (cost)
NEWS	Size < 3 cm Located anywhere in the stomach Intra-luminal	Avoids exposure of lumen throughout procedure	Requires laparoscopic surgical skills and skin incisions Not suitable for large extra-luminal lesions Lesion size limited by per-oral retrieval


Abdominal wall
Lesion
Serosa side
Mucosa side


Abdominal wall
Lesion
Serosa side
Mucosa side


Lesion
Serosa side
Mucosa side


Lesion
Serosa side
Mucosa side

Prospective clinical studies on ESD for treatment of upper GI subepithelial lesions

Author	Year	No. of lesions	Location of lesion	Size of lesion in mm, mean	Operative time, mean (range or SD)	Complications	En bloc/ complete resection	Pathologies
Liu et al. [8]	2012	31	Esophagus Stomach	22.1 × 15.5	76.8 (15–330)	12.9% perforation	30/31	GIST (16) Leiomyoma (15)
Chun et al. [7]	2013	35	Stomach	17.99 ± 7.86	32.3 ± 20.6	6.1% perforation requiring surgical treatment	74.3%	Leiomyoma (60%) GIST (10/35) Neurogenic tumor (2/35) Gastritis cystica profunda (1/35) Inflammatory fibroid polyp (1/35)
Zhang et al. [10]	2013	212	Stomach	16.5		15.1% perforation 4.2% massive bleeding	96.2%	GIST Leiomyoma
He et al. [9]	2014	144	Stomach	15.1 ± 9.7		14.5% perforation 4.8% intra-op bleeding	92.41%	Leiomyoma (52/144) GIST (89/144) Neurogenic tumor (3/144) Lipoma (1/144)
Ye et al. [6]	2015	45	Esophagus	11 ± 6	–	8.9% perforation	95.6%	Leiomyoma (38/43) GIST (5/43)

Per-oral endoscopic tunnel resection (POET) or submucosal tunnel endoscopic resection (STER) studies

Author	Year	No. of lesions	Location of lesion	Size of lesion in mm, mean (range)	Operative time, mean (range)	Complications	Complete resection	Pathologies
Inoue et al. [17]	2012	9	Esophagus Cardia	12 to 30	152.4 (40–365)	Nil	78%	Leiomyoma (5) GIST (1) Aberrant pancreas (1)
Xu et al. [16]	2012	15	Esophagus Cardia Stomach	19 (12–30)	78.7 (25–130)	1 pneumothorax 1 emphysema 1 pneumoperitoneum	–	–
Gong et al. [35]	2012	12	Esophagus Cardia	18.6	48.3	2 pneumothorax 2 emphysema	83.30%	GIST (7) Leiomyoma (5)
Liu et al. [36]	2013	12	Esophagus Cardia	18.5 (10–30)	78.3	66.7% emphysema 33.3% pneumothorax 25.0% pneumoperitoneum 16.7% pleural effusion	–	–
Lu et al. [37]	2014	19	Fundus	20.1	75.1	2 pneumoperitoneum	100%	GIST (13) Leiomyoma (6)
Wang et al. [38]	2014	57	Esophagogastric junction	21.5	47	12 emphysema 5 pneumothorax 3 pneumoperitoneum 2 pleural effusion	100%	Leiomyoma (46) GIST (7) Schwannoma (2) Lipoma (1) Granular cell tumor (1)

Per-oral endoscopic tunnel resection (POET) or submucosal tunnel endoscopic resection (STER) studies

Zhou et al. [39]	2015	21	Esophagogastric junction	23 (10–40)	62.9	9 perforation	–	Leiomyoma (15) GIST (6)
Wang et al. [40]	2015	83	Esophagus Cardia	23.2	61.2	2 emphysema 1 pneumothorax 1 mucosal perforation	97.60%	Leiomyoma (68) GIST (15)
Li et al. [41]	2015	32	Cardia Lesser curvature Greater curvature	23	51.8	1 bleeding 6 pneumoperitoneum 3 pneumothorax 3 emphysema	100%	Leiomyoma (18) GIST (11) Fibrous tumor (11) Glomus tumor (1) Schwannoma (1)
Chen et al. [42]	2017	180	Upper esophagus Middle esophagus Lower esophagus Esophagogastric junction Stomach	Median 2.6 (2.0–5.0)	Median 45 (15–200)	10 pneumothorax/ hydrothorax 2 major bleeding 2 mucosal injury 1 esophageal-pleural fistula	90.6% en bloc	Leiomyoma (146) GIST (28) Schwannoma (4) Fibrous tumors (2)

Laparoscopic endoscopic cooperation surgery studies

Author	Year	No. of lesions	Location of lesion		Size of lesion in mm, mean (range)	Operative time, mean (range)	Complications	Complete resection	Pathologies
Hiki et al.[18]	2008	7	1 OGJ anterior 1 upper anterior 2 upper posterior 1 middle posterior 1 lower anterior 1 remnant posterior		4.6 (3.5–6.0)	169	0	–	GIST (6) Schwannoma (1)
Tsujimoto et al. [44]	2012	20	8 anterior 9 posterior 2 lesser curvature 1 greater curvature	8 upper 8 middle 4 lower	37.9 (18.0–63.0)	157.5 (89–316)	0	100%	GIST (16) Leiomyoma (1) Glomus tumor (1) Aberrant pancreas (1) Inflammation (1)
Kawahira et al. [45]	2012	16	–		0.86 (0.625–1.0)	172 (115–220)	0	100%	–
Hoteya et al. [46]	2014	25	5 OGJ 11 upper 6 middle 3 lower		32.3 (12–72)	156.3 (77–323)	0	100%	GIST (16) Leiomyoma (5) Schwannoma (1) Cavernous hemangioma (1) Aberrant pancreas (2)

CONCLUSIONI

- **LE LESIONI SOTTOMUCOSE RAPPRESENTANO UN PROBLEMA COMPLESSO**
- **NECESSARIA LA GESTIONE MULTIDISCIPLINARE**
- **FONDAMENTALE LA DIAGNOSI DIFFERENZIALE**
- **GIST VS NON GIST**
- **EUS (E «AUGMENTED-EUS») NODO CENTRALE NEL PERCORSO**
- **TRATTAMENTO ENDOSCOPICO OPZIONE PROMETTENTE**

GRAZIE

nicopagano@gmail.com