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SIGE l'oscana: Froi, Nicola de Bortoli

Appropriatezza e Innovazione in Gastroenterologia nell'era dell'open access

La gestione delle lesioni sottomucose del tratto gastroenterico



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"No conflicts of interest to declare".

🚇 Thieme

Endoscopic management of subepithelial lesions including neuroendocrine neoplasms: European Society of Gastrointestinal Endoscopy (ESGE) Guideline



SEL type	Originating layer	Echogenicity	Size, mm	Border	Location in gastro- intestinal (GI) tract
Duplication cyst	3 rd/ external	Anechoic, without Doppler signal		Sharp, sometimes with 5 layers	Any
Varices	3 rd	Anechoic, with Doppler signal		Sharp, serpiginous shape	Any
Lymphangiomas	3 rd	Anechoic with internal septa, without Doppler signal		Sharp	Any
Granular cell tumor	2nd, 3 rd	Hypoechoic, higher echogenicity compared to the muscle layer Heterogeneous	<20	Variable	Esophagus
Gastric inflammatory fibroid polyp	2nd, 3rd	Hypoechoic Homogeneous Polypoid	8-18	Indistinct	Antrum Small bowel
Neuroendocrine neoplasms	2nd, 3rd	Hypoechoic/intermediate hypo- echogenicity/ hyperechoic		Sharp	Stomach Small bowel Rectum
Ectopic pancreas	3 rd, 4th	Hypoechoic Heterogeneous echotexture, with cysts or ducts inside Central umbilication	<5-20	Indistinct	Antrum up to 88% Gastric body Duodenum 16%
Leiomyoma	2nd/4th	Hypoechoic, similar to the muscle layer, lower than for GIST Homogeneous Rarely multiloculated or leiomyo- matosis	Varies	Sharp	Esophagus or stomach or anywhere in the GI tract
GIST low risk	2nd/4th	Hypoechoic Heterogeneous Hypervascular	<30	Sharp when benign	Esophagus 5% Stomach Small intestine Rectum

SEL type	Originating layer	Echogenicity	Size, mm	Border	Location in gastro- intestinal (GI) tract
GIST, high risk	2nd/4th	Hypoechoic Heterogeneous, with cystic space or echogenic foci	>30	Irregular	Esophagus 5% Stomach Small intestine Rectum
Lymphoma	2nd, 3rd, 4th	Hypoechoic	Varies	Irregular	Gastric Small intestine
Schwanomma	4th	Hypoechoic Homogeneous, sometimes with marginal halo		Sharp	Gastric body
Glomus tumor	3 rd/4th	Hypo-/hyperechoic Hypervascular, with internal echo	Varies	Sharp	Any
Endometriosis	4th, 5th	Hypoechoic Heterogeneous, Might extend into the rectovaginal septum	20-50	Irregular	Rectum Sigmoid colon
Lipoma	3 rd	Hyperechoic Homogeneous	Varies	Sharp	Any
Brunner gland hyper- plasia	2nd or 3rd	lso-/hyperechoic Homogeneous Sometimes with duct inside		Sharp	Duodenal bulb
Metastasis	Any	Hypoechoic		Irregular	Any
GIST, gastrointestinal stro	mal tumor.				

Deprez HP et al., Endoscopy 2022

Find the differences.....if you can



GIST

NET

LEIOMYOMA

DUPLICATION CYST

Raffaele Manta experience

Current Guidelines in the Management of Upper Gastrointestinal Subepithelial Tumors



ACG Clinical Guideline: Diagnosis and Management of Gastrointestinal Subepithelial Lesions



ACG Clinical Guideline: Diagnosis and Management of Gastrointestinal Subepithelial Lesions



CME

Endoscopic management of subepithelial lesions including neuroendocrine neoplasms: European Society of Gastrointestinal Endoscopy (ESGE) Guideline

> Tissue acquisition Yes or no?

RECOMMENDATION

ESGE suggests providing tissue diagnosis for all SELs with features suggestive of GIST, if they are of size >20 mm, or have high risk stigmata, or require surgical resection or oncological treatment.

Weak recommendation, very low quality evidence.

The addition of tissue acquisition increases the diagnostic accuracy from a range of 30%–50% to a range of 73%–84% !!!!!

Endoscopic management of subepithelial lesions including neuroendocrine neoplasms: European Society of Gastrointestinal Endoscopy (ESGE) Guideline

Resection? When should be performed?

	Resection (Y/N)	When?
Esophagus		
Granular cell tumor	Y	Dysphagia
Leiomyomas	Y	Symptoms (obstructive)
Stomach		
NEN type I > 10 mm	Y	
GIST < 20 mm	Possible resection	Eliminate risk of evolution
GIST < 35 mm (non metastatic)	Y	
Lipomas	Y	Symptoms
Leiomyomas	Y	Symptoms
Duodenum		
NEN < 15 mm	Y	

THERAPY OF EGC

SURGERY= GOLD STANDARD

JGES-JGCA , Hiroyuki Ono et al. Digestive Endoscopy 2016; 28: 3–15 ESGE Pimentel-Nunes Pedro et al. Endoscopy 2015; 47: 829–854

SUB-MUCOSAL LESIONs Which therapy?



Endoscopic approach

Enucleation

- Submucosal dissection (STER)
- Tunneling
- Full-thickness resection

Endoscopy

as main tool

SURGERY could assist Endoscopy

- Laparoscopy-endoscopy coassisted surgery (LECS)
- Non-Exposed Wall inversion Surgery (NEWS)

Laparoscopy and Endoscopy as main tools

GIST: Gastrointestinal Stromal Tumor CLASSIFICATION



Of the four types, type I s the best candidate for endoscopic enucleation due to its narrow connection with the PM layer, and it seems possible to remove type II lesions by endoscopic enucleation.

GIST: Gastrointestinal Stromal Tumor CLASSIFICATION



it is nearly impossible to achieve complete resection of type III and type IV GISTs by endoscopic enucleation. Thus, EFTR, LECS, LAEFR, or NEWS should be considered for type III and IV GISTs. Gastrointestinal Stromal Tumor Therapy: endoscopic enucleation



FIGURE 1. Endoscopic submucosal excavation. A, A gastrointestinal submucosal tumor arising from superficial muscularis propria. B, Submucosal injection. C, Longitudinal mucosal incision. D, Submucosal dissection to expose the tumor. E, Enucleation of tumor. F, Closure of mucosal incision using clips.

Gastrointestinal Stromal Tumor Therapy: endoscopic enucleation

ENDOSCOPIC SUBMUCOSAL DISSECTION



Duodenal NET resection: ESD technique



Duodenal-bulb 2.6 cm nodular lesion ESD (courtesy form L. Regiani



Nodular aspect of the resected lesion

Vertical margin: no infiltration

Neoplastic pits – Intestinal glands –

Gastric Lipoma rection: ESD technique



(R.M.; Livorno database)

Sub-mucosal lesions therapy: endoscopic enucleation of Gastric fundus Leyomioma from M Muc. by using ESD technique



GE – Portuguese Journal of Gastroenterology

Research Article

GE Port J Gastroenterol 2023;30:115–120 DOI: 10.1159/000525993 Received: October 14, 2021 Accepted: February 11, 2022 Published colored

Endoscopic Submucosal Dissection for Subepithelial Tumor Treatment in the Upper Digestive Tract: A Western, Multicenter Study

Raffaele Manta^a Francesco Paolo Zito^b Francesco Pugliese^c Angelo Caruso^d Santi Mangiafico^d Alessandra D'Alessandro^e Danilo Castellani^a Ugo Germani^a Massimiliano Mutignani^c Rita Luisa Conigliaro^d Luca Reggiani Bonetti^f Takahisa Matsuda^g Vincenzo De Francesco^h Angelo Zulloⁱ Gluseppe Galloro^j **Patients and Methods:** Date of patients with upper GI-SETs suitable for ESD removal observed in 4 centers were retrospectively reviewed. Before endoscopic procedure, the lesion was characterized by endosonographic evaluation, histology, and CT scan. The *en bloc* resection and the R0 resection rates were calculated, as well as incidence of complications, and the 1-year follow-up was reported. **Re**-

RESULTS

Tab	ole '	 Result 	ts accord	ling to	site and	lesions
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Site	N	Histology	Mean size (range), mm	Te su
Esophagus	13	13 leiomyomas	24 (21–52)	13
Proximal stomach (cardia, corpus, fundus)	17	6 lipomas; 5 GISTs; 3 NETs; 2 leiomyomas 1 hamartoma	30 (20–110)	16
Distal stomach (angulus, antrum)	44	19 leiomyomas; 10 GISTs; 8 lipomas 6 NETs; 1 hamartoma	37 (25–60)	44
Duodenum	10	4 lipomas; 3 NETs 2 GISTs; 1 hamartoma	13 (12–20)	10
Total	84	84	26 (12–110)	83



GE – Portuguese Journal of Gastroenterology

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CONCLSIONSCONCLSIONSalternative to surgical intervention for both benign and lo-
calized malignant GI-SETs.© 2022 The Author(s).

Published by S. Karger AG, Basel

Gastrointestinal Stromal Tumor Therapy: endoscopic enucleation

"Tunnel dissection" technique



Sub-mucosal lesions therapy: endoscopic enucleation of Esophageal GIST (type I)

Tunnel dissection technique







(R.M.; Perugia database)

Sub-mucosal lesions therapy: endoscopic enucleation of Esophageal GIST (Type I)

Tunnel dissection technique







Sub-mucosal lesions therapy: endoscopic enucleation of Gastric GIST (type I)

Endoscopic submucosal tunnel dissection



Gastrointestinal Stromal Tumor THERAPY: Endoscopic Enucleation

"full thickness" technique



FIGURE 2. Endoscopic full-thickness resection. A, A gastrointestinal submucosal tumor in deep muscularis propria. B, Submucosal injection. C, Longitudinal mucosal incision. D, Submucosal dissection deep to serosa to expose the tumor. E, latrogenic perforation and enucleation of tumor. F, Closure of mucosal incision using clips.

Sub-mucosal lesions therapy: endoscopic enucleation by full-thikness technique of 30 mm Gastric-fundus GIST



video 1.

R.M.: Perugia exeperience

Sub-mucosal lesions therapy: endoscopic enucleation by full-thikness technique of 20 mm Gastric fundus GIST

video 2.



R.M.: Modena exeperience

2015: Full Thickness Resection Device (FTRD - Ovesco)





GIST: Gastrointestinal Stromal Tumor THERAPY: Endoscopic enucleation

Over-the-Scope Clip-Assisted Endoscopic Full-Thickness Resection



R.Manta 2015 Nocsae 206

Gastrointestinal Stromal Tumor THERAPY

Kim HH. Endoscopic treatment for GIST 2021

 Table 2 Recent publications reporting endoscopic enucleation and endoscopic full-thickness resection for upper gastrointestinal tumors originating from the proper muscle layer

Ref.	n	Method	Mean operation time (min)	Mean tumor diameter (mm)	Complete resection rate (%)	Complications/recurrence
Wang et al ^[43] (2014)	86	Standard ESD	-	-	100	4 delayed bleedings
						9 perforations
						5 local recurrences
Ye et al ^[47] (2014)	85	ESTD	57	19	100	4 pneumothorax and subcutaneous
						emphysema
						2 pneumothorax
						2 subcutaneous emphysema
Feng et al ^[49] (2014)	48	EFTR	60	16	100	0
Li et al ^[48] (2012)	143	ESD (134), EFTR	45	18	94 ¹	2 pneumothorax,
		(6), ESTD (3)				1 subcutaneous emphysema
Białek <i>et al</i> ^[42] (2012)	22	Standard ESD	-	-	68 ¹	2 perforations
Liu et al ^[44] (2013)	31	EMD	77	22	97	4 perforations
Inoue <i>et al</i> ^[45] (2012)	7	SET	152	19	100	0
Gong et al ^[46] (2012)	12	ESTD	48	20	83	2 pneumothorax
						and subcutaneous emphysema
Zhou et al ^[52] (2011)	26	EFTR	105	28	100	0
Hwang et al ^[41] (2009)	25	ESD	-	29	64	3 perforations
Lee et al ^[40] (2006)	11	ESD	61	21	75	0

Gastrointestinal Stromal Tumor

Endoscopic therapy based on Gastric Location



Endoscopic approach

Enucleation

- Submucosal dissection
- Tunneling
- Full-thickness resection

Endoscopy

as main tool

SURGERY could assist Endoscopy

 Laparoscopy-endoscopy coassisted surgery (LECS)

 Non-Exposed Wall inversion Surgery (NEWS) Laparoscopy and Endoscopy as main tools

Gastrointestinal Stromal Tumor THERAPY: NEWS (Non-Exposed Wall inversion Surgery)



Gastrointestinal Stromal Tumor THERAPY: LECS


Gastrointestinal Stromal Tumor THERAPY

Table 3 Publications reporting laparoscopic and endoscopic cooperative surgery, laparoscopy-assisted endoscopic full-thickness resection, and non-exposed wall-inversion surgery for submucosal tumors in the upper gastrointestinal tract

Ref.	n	Method	Mean operation time (min)	Mean tumor diameter (mm)	Complete resection rate (%)	Complications	
Mitsui et al ^[41] (2014)	6	NEWS	306	34	100	0	
Hoteya et al ¹⁹⁴ (2013)	25	LAFER	156	32	100 ¹	0	
Tsujimoto et al ⁹⁴ (2012)	20	LECS	157	38	100 ¹	0	
Hiki et al ⁶⁶¹ (2011)	38	LECS			100	0	
Abe et al ^[10] (2009)	4	LAEFR	201	30	100 ¹	0	
Hiki et al ⁸⁸ (2008)	7	LECS	169	46	100	0	

³Pathologically evaluated. LAEFR: Laparoscopy-assisted endoscopic full-thickness resection; LECS: Laparoscopic and endoscopic cooperative surgery; NEWS: Non-exposed wall-inversion surgery.

LAPARO-ASSISTED ENDOSCOPIC ENUCLEATION

PRO

- gastric tissue spearing;
- mini-invasive technique.
- avoid post-surgical complications

(- fistulas: Esofago (8.10%) Stomaco: (4-6%)

- stenosis).

- It is a strong support technique for endoscopist
- cheaper than surgery

CONTRARY

- Long procedure

(Time and "doctors" consuming)

- Skilled endoscopist are needed
- RO? To be demonstrated
- Early and Late complications are present

Electrosurgical units

2004. VIO GI Workstation VIO 300 D/ VIO 200 D 2005. ENDO CUT IQ APC 2/ EIP 2 ERBEJET 2

- High-frequency generator with an automatically controlled system
- A sensor can control the power automatically and adjust to the circumstance achieving smoother and safer dissection





Water pump

Faster and accurate coagulation

·····	CREMENT
Transation of the local division of the loca	900
0	

Insufflation with CO₂

- Fewer sedative medications
- Lower risk of compartment syndrome following perforation



Hood

- Better visualization during dissection
- Useful during hemostasis

Endoknives

Tip cutting knives

 Needle-knife extremity that can be used for marking, cutting, dissection and hemostasis



ERBE-JET2 - Hybrid-Knife

VIO Workstation (ERBE-JET2) + ERBE Water-Jet station





Endoscopic management of subepithelial lesions including neuroendocrine neoplasms: European Society of Gastrointestinal Endoscopy (ESGE) Guideline

Surveillance? When and How?

RECOMMENDATION

ESGE recommends against surveillance of asymptomatic GI leiomyomas, lipomas, heterotopic pancreas, granular cell tumors, schwannomas, and glomus tumors, if the diagnosis is clear.

Strong recommendation, moderate quality evidence.

RECOMMENDATION

ESGE suggests surveillance of asymptomatic esophageal and gastric SELs without definite diagnosis, with EGD at 3–6 months, and then at 2–3-year intervals for lesions <10 mm in size and at 1–2-year intervals for lesions 10– 20 mm in size. For asymptomatic SELs >20 mm in size that are not resected, ESGE suggests surveillance with EGD plus EUS at 6 months and then at 6–12-month intervals.

Weak recommendation, very low quality evidence.

RECOMMENDATION

ESGE suggests that for duodenal and colorectal SELs, all attempts should be made to establish a definite diagnosis to guide further decisions, since there is no evidence that surveillance is a safe option.

Weak recommendation, very low quality evidence.



CONCLUSIONS «Requisites to Perform ESD»

- Experience and technical skills in performing therapeutic procedures such as polypectomy and EMR
- Ability to manage bleeding and perforative co
- Knowledge of endoscopic accessories and elec
- Training on biological simulators



- Involvement as a second operator/assistant in at least 20 ESD
- Execution of ESD with an experienced operator supervision
- Correct indication and selection of cases



Upcoming...





















P.C.R.F. (Palestine Children's Relief Found) for Gaza strip umanitarian crisis











P.C.R.F. (Palestine Children's Relief Found) for Gaza strip umanitarian crisis



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Versamenti PayPal :https://donorbox.org/pcrf



Grazie per la vostra attenzione !



LIVORNO'S "ENDOSCOPY "DREAM TEAM"

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ESD for SUBMUCOSAL LESIONS OF GI TRACT: a personal experience (2014-2020)

	N (%)		
N° patients	27		
Sex (M/F)	13/14		
Age (yrs)	68.8 ±13.1		
Type of lesion, GIST Leiomyoma Lipoma Hamartoma	12 (44) 12 (44) 1 (4) 2 (8)		
Location, Fundus Cardias Corpus Antrum Duodenum	11 (41) 7 (26) 2 (8) 5 (17) 2 (8)		
Size range (cm)	2-10		
Mean size (cm)	4.8 ± 1.5		
Early complication, Bleeding Perforation	4 (15) 1 (4)		
Late Complication	0 (0)		
Technical success	27/27 (100)		
Time of procedure (min)	88.3 ± 34.0		
Hospital stay (days)	5.1 ± 1.3		
Relapse at 3 months of FU	1/27 (4)		
Relapse at 12 months of FU	0/27 (0)		









Endoscopic Submucosal Dissection (ESD)

The mucosa surrounding the lesion is excised using a high-frequency

diathermy knife, followed by dissection of the submucosa beneath the

lesion



Requisites to Perform ESD

Training at the source (November 2008)









Demarcation of the borders



- Mucolytic (acetylcysteine) and defoaming agents (dimethicone)
- Endoscopy with dye spraying ($\approx 80\%$ of lesions)
- Image-enhanced endoscopy

Marking



- 5 mm safe margin with intermittent and short application of coagulation
- Tip of a snare, needle knife or argon plasma coagulation

Submucosal Injection



- Injection agent
- Indigo carmine
- Epinephrine
- Needle 23G (or 25G)

Solution	Cushion duration	Advantages	Disadvantages
Normal saline solution (0.9%)	+	Easy to inject, inexpensive, readily available	Dissipates quickly, short duration of mucosal lifting
Hypertonic sodium chloride (3.0%)	++	Easy to inject, inexpensive, readily available	Possible tissue damage and local inflammation at injection sites
Hyaluronic acid (0.13%-0.4%)	++++	Longest-lasting cushion	Limited availability in the U.S. Off-label use preparations available in the U.S. require further clinical evaluation
Hydroxypropyl methylcellulose (0.3%-0.8%)	+++	Long-lasting cushion, relatively inexpensive	Possible tissue damage and local inflammation at injection sites
Succinylated gelatin	++	Easy to inject, inexpensive, readily available	Contraindicated in patients with gelatin hypersensitivity
Glycerol (10%)	++	Inexpensive	
Dextrose (20%, 30%, 50%)	++	Inexpensive, readily available	Possible tissue damage and local inflammation at injection sites Increased risk of postpolypectomy syndrome
Albumin	++	Easy to inject, available in most endoscopy units	Expensive
Fibrinogen	+++	Easy to inject, long-lasting cushion	Expensive, not readily available

NOCSAE Protocol

Incision of the Periphery and Trimming

- Circumferential incision outside the marked area
- Incision of the mucosa and of the muscularis mucosae (trimming)
- Tip cutting knife or a blunt tip knife

Dual Knife: endo cut 1, eff 4, swift coag, 30 w





Submucosal dissection



- Good visualization and abundant submucosal lifting
- Axis of the tip of the cutting knife parallel or oblique to the muscularis area
- Pedal pressed intermittently
- Submucosal fibers hooked and retracted before cutting



Visible vessels coagulated before dissection

Submucosal dissection

IT Knife2: e-cut 1, eff. 4, swift coag., 30 w



Coagulation

Dual Knife: soft coag, eff. 4, 80 w



Mucosectom: endo cut 1, eff. 4, swift coag, 30 w



Coagrasper: forced coag, eff. 4, 60 w



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Endoknives

Tip cutting knives

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ERBE-JET2 - Hybrid-Knife

VIO Workstation (ERBE-JET2) + ERBE Water-Jet station





Endoknives

Blunt-tip knives

- An insulated tip prevents coagulation of the muscle layer
- Not suitable for marking but submucosal dissection may be faster

Scissor-type knives

- All steps of ESD
- Their use is not yet wide spread



Mucosectom (Pentax)







Clutch Cutter (Fujifilm)

ESD for SUBMUCOSAL LESIONS OF GI TRACT: a personal experience (2014-2017)

NOCSAE BAGGIOVARA MODENA – NIGUARDA CA'-GRANDA MILANO					
GIST:	6	(2 esofago)	3 (stomaco)	1 (Bulbo duod.)	
		<u>Mean size</u> : 3,8 cm <u>Mean time:</u> 77 min Complicanze: nessu Recidiva: nessuna	(range 2 (range 44 – 240 m una;	- 11 cm) in)	
<mark>Leiomyoma</mark> (7 from MM layer)	11	(2 esofago) <u>Mean Size</u> : _2,9 cm <u>Mean time:</u> _68 min Complicanza: «ong	(7 stomaco) n (range. 1 n(range 38 – 147) oing «microperforaz	2 (bulbo) ,8 - 6.7 cm) ione trattata	
	endoscop	vicamente con TTS cli <u>Recidiva</u> : nessuna	ps;		
Amartoma	1	(Bulbo duodenale) <u>Size:</u> 5 cm; <u>Complicanza</u> : Nessu	<u>Time:</u> 111 min una; <u>Recidiva</u>	a 3 mesi	
ESD for SUBMUCOSAL LESIONS OF GI TRACT: a personal experience (2014-2017)



NOCSAE BAGGIOVARA MODENA – NIGUARDA CA'-GRANDA MILANO









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