ENDOSCOPIC ULTRASONOGRAPHY IN SUBMUCOSAL LESIONS AND EXTRINSIC COMPRESSIONS OF THE GASTROINTESTINAL TRACT

Lidia Argüello

Hospital La Fe. Valencia
Spain
SUBMUCOSAL LESION

Protusion in the lumen

Extrinsic compressions

Submucosal tumors
SUBMUCOSAL LESION

Protusion in the lumen

Extrinsic compressions

Submucosal tumors
SUBMUCOSAL LESION

Protusion in the lumen

Extrinsic compressions

Submucosal tumors

Conventional endoscopy, biopsies
US, CT

No distinguish between these lesions
Endoscopic Ultrasonography (EUS)

Endoscopy

+ 

Ultrasound
Endoscopic ultrasonography

The different layers of the digestive wall

- mucosa
- submucosa
- muscularis propria
Endoscopic ultrasonography

The structures adjacents to digestive wall

- Mediastinum.
- Pancreas.
- Bile duct, gallbladder.
- Vessels: celiac artery, portal vein...
- Lymph nodes.
Endoscopic ultrasonography

The structures adjacents to digestive wall

- Mediastinum.
- Pancreas.
- Bile duct, gallbladder.
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- Lymph nodes.

From esophagus
Endoscopic ultrasonography

The structures adjacents to digestive wall

From stomach and duodenum

- Mediastinum.
- Pancreas.
- Bile duct, gallbladder.
- Vessels: celiac artery, portal vein...
- Lymph nodes.
Extrinsic Compressions
EXTRINSIC COMPRESSIONS

- EUS is the procedure of choice
- EUS distinguish between extrinsic compression and submucosal tumour

Precision: 95%

Rösch. Gastrointest Endosc Clin N Am 1995
EXTRINSIC COMPRESSIONS

- EUS is the procedure of choice
- EUS distinguish between extrinsic compresion and submucosal tumour
  
  Precision: 95%

- EUS allows to determine the nature of the structure responsible of a compression: pathological or anatomical.

Rösch. Gastrointest Endosc Clin N Am 1995
EXTRINSIC COMPRESSIONS

- Anatomical structure

EUS avoids:

- The need for further explorations (CT, RMN)
- The risk of a biopsy
EXTRINSIC COMPRESSIONS

- Pathological structure: Tumour

EUS allows to evaluate
- The grade of invasion of the digestive wall and the surrounding organs.
- The diagnosis of extraluminal masses
  
  EUS-FNA precision > 90%

THE MAIN CAUSES OF EXTRINSIC COMPRESSIONS IN THE GI SUPERIOR TRACT

<table>
<thead>
<tr>
<th>Oesophagus</th>
</tr>
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<tbody>
<tr>
<td>Vascular: aorta</td>
</tr>
<tr>
<td>subclavian lusoria artery</td>
</tr>
<tr>
<td>Vertebras.</td>
</tr>
<tr>
<td>Mediastinal tumours</td>
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<thead>
<tr>
<th>Stomach</th>
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<tbody>
<tr>
<td>Fundus: splenic vessels, spleen.</td>
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<tr>
<td>Body: pancreas.</td>
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<tr>
<td>Antrum: gallbladder, liver.</td>
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<td>Gallbladder</td>
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<td>Pancreas: tumours, seudocyst.</td>
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| Lymph nodes or metastasis anywhere |
Submucosal Tumours
Definition

- A variety of heterogeneous lesions that develop in the wall of the GI tract.
Definition

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- Mesenchymal tumors: GIST.
- Another tumors: carcinoid, metastasis.
- Cysts
  - dilation cyst of the esophagus gland
  - broncogenic cyst
  - gastric wall cyst
  - dystrophy cystic.
- Malformation: duplication cyst
SUBMUCOSAL TUMOURS

Definition

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- Mesenchymal tumors
- Another tumours: carcinoide, metastasis.
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SUBMUCOSAL TUMOURS

Mesenchymal tumours

- Mesenchymal tumours are uncommon (1% of all GI tumours).

- Clinical characteristics:
  Asymptomatic for long period of time.
  Symptoms are related to size and location.
  From 10 to 30% are found incidentally during an endoscopy.

*Miettinen M et al. Hum Pathol 1999*
CLASSIFICATION OF MESENCHYMAL TUMOURS

A new classification based on immunohistochemical characteristics

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Allow distinguish GIST

Miettinem. Virchow Arch 2001
Why are GISTs so important to be recognized?

- GIST are the most common mesenchymal neoplasms of the GI tract.

- Clinical behaviour and prognosis are different than in other mesenchymal t.
  >30% of GISTs are malignant at the time of diagnosis

- Surgery is the standard treatment.

- Effective treatment for metastatic or unresectable GISTs.

Miettinen M et al. Hum Pathol 1999

Savage N Eng J Med 2002
Mesenchymal tumours

**DIAGNOSIS**

- Conventional endoscopy
  Incapable of confirming the type of tumor
  Biopsies negatives

- EUS is the best imaging technique for evaluating submucosal lesions
  Sensitivity 92%
  Specificity 100%

*Rösch et al. Scand J Gastroenterol 2002*
Mesenchymal tumours

DIAGNOSIS

EUS

Morphological features:

- Size
Mesenchymal tumours

DIAGNOSIS
EUS

Morphological features:

- Size
- Location in the wall
Mesenchymal tumours

DIAGNOSIS

EUS

Morphological features:

- Size
- Location in the wall
- Ultrasound features:
  solid or cystic
  borders, homogeneity
  anechoic areas
Mesenchymal tumours

DIAGNOSIS
EUS

Morphological features:

- Size
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- Ultrasound features:
  solid or cyst
  borders, homogeneity
  anechoic areas

Help to establish an adequate treatment
Mesenchymal tumours

DIAGNOSIS
EUS

Classical criterias for malignancy

- Size > 4 cm
- Heterogeneous.
- Anechoic areas.
- Irregular border.
- Solid nodules.
Mesenchymal tumours

DIAGNOSIS
EUS

Classical criteria for malignancy

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Chak et al, Gastrointest Endosc 1997
Mesenchymal tumours

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Likelihood for malignancy 80-100%

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Mesenchymal tumours

**DIAGNOSIS**
**EUS**

**Classical criteria for malignancy**

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Likelihood for malignancy 80-100%

*Surgery is indicated*

*Chak et al, Gastrointest Endosc 1997*
Mesenchymal tumours

DIAGNOSIS
EUS

- Morphological criteria are not enough to differentiate between benign and malignant tumors.

- It’s difficult to decide the treatment in:
  - Asymptomatic patients
  - Tumours without endosonographic signs of malignancy
Mesenchymal tumours

DIAGNOSIS
EUS

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• GIST should be considered as a tumor potentially malignant

An accurate diagnosis of GIST is crucial.
Mesenchymal tumours

**DIAGNOSIS**

**EUS**

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- It's difficult to decide the treatment in:
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**EUS GUIDED FINE-NEEDLE ASPIRATION (EUS-FNA)**

To cytology

- Tumors without endosonographic signs of malignancy

- GIST should be considered as a tumor potentially malignant

An accurate diagnosis of GIST is crucial.
Mesenchymal tumours

EUS-FNA

- Less useful than in other settings (pancreas, lymph nodes...) based on cytology alone but:

- New immunohistochemical technique may help to overcome this limitation

Williams et al. Gut 1999

Rader at al. Cancer Cytopatholol 2001
Akahoshi et al. World J Gastroenterol 2007
Gu et al. Diagn Cytopathol 2001
Mesenchymal tumours

EUS-FNA

- Immunohistochemical phenotype can be assessed by EUS-FNA
- GIST can be diagnosed

Rader et al. Cancer Cytopathol 2001
Akahoshi et al. World J Gastroenterol 2007
Mesenchymal tumours

EUS-FNA

• Immunohistochemical phenotype can be assessed by EUS-FNA
  GIST can be diagnosed

  Rader et al. Cancer Cytopatholol 2001
  Akahoshi et al. World J Gastroenterol 2007

• Immunohistochemical stainning for ki-67 help to establish the grade of malignancy.

  Ando et al. Gastrointest Endosc 2002
  Okubo et al. Am J Gastroenterol 2004
Mesenchymal tumours

EUS-FNA

Needles

- The majority of studies have been performed with needles of 22G.
Mesenchymal tumours

EUS-FNA

Needles

- The majority of studies have been performed with needles of 22G.
- Larger needles and EUS guided trucut biopsy may improve results.
- No randomized studies.

Ribeiro et al. Gastrointest Endosc 2004
Mesenchymal tumours

EUS-FNA

- The need of EUS-FNA in subepithelial tumors is controversial.

- Methodological issues limit to have conclusions:
  - Heterogeneity in design
  - Retrospective studies
  - Few patients
  - Gold standards (\% of resection)
Mesenchymal tumours

EUS-FNA

- The need of EUS-FNA in subepithelial tumors is controversial.
- Methodological issues limit definitive conclusions:
  - Heterogeneity of design
  - Retrospective studies
  - Few patients
  - Gold standards (% of resection)
- EUS-FNA is indicated when results may change therapeutic approach.
Endoscopic ultrasonography provides an accurate exploration of the wall of the digestive tube.

EUS is the procedure of choice for the diagnosis of submucosal lesions.

EUS allows to define the characteristics of the lesion and makes possible to perform fine-needle aspiration or biopsies to study with immunohistochemical analysis.