Endoscopy in gastric cancer: New imaging techniques, new treatment modalities (EMR, ESD)

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Disclosure of interest

“No conflict of interests”
Role of endoscopy in gastric cancer:

1. SCREENING
2. DIAGNOSIS
3. STAGING
4. TREATMENT
New imaging techniques, new treatment modalities (EMR, ESD)

1. Screening
Correa Model of carcinogenesis
Preneoplastic conditions
Neoplastic lesions
“Early detection and treatment is the only way to reduce mortality”
Importance of endoscopy

High level of acid production

Normal gastric mucosa → Acute H. pylori infection → Chronic H. pylori infection → Nonatrophic pangastritis → Corpus-predominant atrophic gastritis → Intestinal metaplasia → Dysplasia → Gastric cancer

Low level of acid production

Childhood → Advanced age

Preneoplastic conditions

Screening → Neoplastic lesions → “Early stages”
SCREENING POPULATION?

PRENEOPLASTIC CONDITIONS?

NEOPLASTIC LESIONS?

1º screening

2nd surveillance

SCREENING POPULATION

Inmigrants (high risk regions) Family History

“Oportunistic screening” (EGD endoscopies)

PRENEOPLASTIC CONDITIONS

Chronic Atrophic Gastritis (CAG)
Gastrointestinal metaplasia (GIM)

NEOPLASTIC LESIONS

Displasia (Intraepithelial neoplasia)
Adenocarcinoma

screening

1º

surveillance

2nd

Detection of EGC will improve the survival rate of this cancer.

Eastern Countries (Japan, Korea): 60% of gastric cancers are EGC (early gastric cancer)

Western Countries: Only less than 10%.

Is time for new imaging techniques?
first step: is high-quality endoscopy: 
Rutine Conventional With Light Endoscopy (WLE)

- 7 minutes
- Adequate preparation
- Insuflation
- Image documentation
- Avoid Blind Areas (SSS protocol)

SSS protocol
WHITE LIGHT ENDOSCOPY (WLE): Chronic atrophic gastritis

- Loss of gastric folds
- Mucosal pallor
- Increase visibility of mucosal vessels
WITHE LIGHT ENDOSCOPY (WLE): GASTRIC INTESTINAL METAPLASIA (GIM)

- white plaquelike lesions with a verrucous appearance
White light endoscopy in the diagnosis of Chronic atrophic gastritis and intestinal metaplasia

- Poor sensitivity and specificity
- Poor interobserver agreement
- Poor correlation with histology

Cshronic atrophic gastritis

Intestinal metaplasia

4. Conventional white light endoscopy cannot accurately differentiate and diagnose preneoplastic gastric conditions (evidence level 2++, recommendation grade B) [agree 94% (vote: a, 46%; b, 24%; c, 24%; d, 4%; e, 2%)].
White light endoscopy in the diagnosis of Chronic atrophic gastritis and intestinal metaplasia

The *diagnosis and risk stratification of premalignant changes* in the stomach, such as chronic atrophic gastritis (CAG) and gastric intestinal metaplasia (GIM), *are reliant on histopathology*.
“Non-targeted biopsies”

Update Sidney System

Staging CAG and GIM: OLGA and OLGIM system

**TABLE 1. The OLGA staging system**

<table>
<thead>
<tr>
<th>Atrophy score</th>
<th>Not fat: no atrophy (score 0)</th>
<th>Mild atrophy (score 1)</th>
<th>Moderate atrophy (score 2)</th>
<th>Severe atrophy (score 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antrum (including incisura angularis)</td>
<td>No atrophy (score 0)</td>
<td>Stage 0</td>
<td>Stage I</td>
<td>Stage II</td>
</tr>
<tr>
<td>Mild atrophy (score 1)</td>
<td></td>
<td>Stage I</td>
<td>Stage I</td>
<td>Stage II</td>
</tr>
<tr>
<td>Moderate atrophy (score 2)</td>
<td></td>
<td>Stage II</td>
<td>Stage II</td>
<td>Stage III</td>
</tr>
<tr>
<td>Severe atrophy (score 3)</td>
<td></td>
<td>Stage III</td>
<td>Stage III</td>
<td>Stage IV</td>
</tr>
</tbody>
</table>

OLGA, Operative link on gastritis assessment.

**TABLE 2. Proposal for the OLGIM staging system**

<table>
<thead>
<tr>
<th>IM score</th>
<th>Not fat: no IM (score 0)</th>
<th>Mild IM (score 1)</th>
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<tr>
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</tr>
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<td></td>
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<tr>
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<td></td>
<td>Stage II</td>
<td>Stage II</td>
<td>Stage III</td>
</tr>
<tr>
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<td></td>
<td>Stage III</td>
<td>Stage III</td>
<td>Stage IV</td>
</tr>
</tbody>
</table>

IM, Intestinal metaplasia; OLGIM, operative link on gastric intestinal metaplasia assessment.

The significance of OLGA and OLGIM staging systems in the risk assessment of gastric cancer: a systematic review and meta-analysis

RELATIVE RISK: OLGIM,OLGA LOW STAGES (I/II) VS HIGH STAGES (III/IV)

- OLGIM III/IV: RR=3.99
- OLGA III/IV: RR=27.70

- six case–control studies and two cohort studies,
- 2700 subjects
Patients with atrophic gastritis and/or intestinal metaplasia without dysplasia

Extension

Magnification chromoendoscopy and/or narrow band imaging (NBI) may be offered

Several biopsies should be obtained (≥2 in antrum and ≥2 in corpus; lesser and greater curvature)

Spread of lesions

Mild/moderate atrophic gastritis or intestinal metaplasia only in antrum

Atrophic gastritis or intestinal metaplasia both in antrum and corpus

H. pylori eradication

Follow-up

Patients with dysplasia

Visible endoscopic lesion?

No

Yes

Grade of dysplasia

Low grade

High grade

Staging and resection *

Immediately and 6–12 months

< 12 months

Every 3 years
Update Sidney System

Limitations........

- Low accuracy in WLE detection of CAG and GIM
- “Non-targeted biopsies (blind)
- Poor correlation endoscopy and biopsies
- Poor interobserver agreement in histology (OLGA/OLGIM)

Is it possible to improve the diagnosis of CAG and GIM? New advanced techniques???? The era of “optic diagnosis”
**Conventional endoscopy**

**New advanced imaging techniques**

**White light endoscopy (WLE)**
New advanced imaging techniques

- Dye-Based Image-Enhanced Endoscopy (Chromoendoscopy)
- image-enhancing endoscopy techniques (virtual Chromoendoscopy):
  - Narrow Band Imaging (NBI)
  - Others (FICE, iScan...)
- Magnifying Endoscopy:
  - Magnifying Endoscopy + Chromoendoscopy
  - Magnifying Endoscopy + NBI
- Confocal Laser endomicroscopy (CLE)
- Endoscopic ultrasound (EUS)

Conventional endoscopy

White light endoscopy (WLE)
Dye-Based Image-Enhanced Endoscopy (Chromoendoscopy)

**INDIGO CARMINE**: morphological characteristics of the *surface mucosa*

**METHYLENE BLUE**: Stains *gastric intestinal metaplasia*
Dye-Based Image-Enhanced Endoscopy (Chromoendoscopy) with WLE

CHRONIC ATROPHIC GASTRITIS (Indigo carmine)
image-enhancing endoscopy techniques (“virtual chromoendoscopy”): **NARROW BAND IMAGING (NBI)**

- **Vascular and surface architecture**
  - superficial capillary network
  - Depth collecting vessels

- Blue and green narrowband lights (absorbed by hemoglobin)
NARROW BAND IMAGING (NBI)

“Normal gastric Body”
“Normal antrum”
NARROW BAND IMAGING (NBI)

“intestinal metaplasia”
Magnifying Endoscopy (ME)

OPTIC ZOOM (x80)
“Real-time Optic diagnostic”

M-WLE

ME + CHROMOENDOSCOPY
Microsurface mucosa structure
ME + Narrow Band imaging (NBI)
Mucosal microvascular architecture
Magnifying Endoscopy (ME) + Chromoendoscopy (indigo carmine)

NORMAL BODY

INTESTINAL METAPLASIA
Magnifying Endoscopy + NBI (M-NBI)

Normal corpus-fundus mucosa
Normal antral mucosa
Magnifying Endoscopy + NBI (M-NBI)

GASTRIC INTESTINAL METAPLASIA

Light blue crest
Marginal turbid band
Management of precancerous conditions and lesions in the stomach (MAPS): guideline from the European Society of Gastrointestinal Endoscopy (ESGE), European Helicobacter Study Group (EHSG), European Society of Pathology (ESP), and the Sociedade Portuguesa de Endoscopia Digestiva (SPED)

Diagnosis and staging

Endoscopy

4. Conventional white light endoscopy cannot accurately differentiate and diagnose preneoplastic gastric conditions (evidence level 2++, recommendation grade B) [agree 94% (vote: a, 46%; b, 24%; c, 24%; d, 4%; e, 2%)].

5. Magnification chromoendoscopy and NBI, with or without magnification, improve the diagnosis of gastric preneoplastic conditions/lesions (evidence level 2++, recommendation grade B) [agree 98% (vote: a, 47%; b, 27%; c, 24%; d, 2%); 83% of voters stated that they would apply this statement; 67% of those representing national societies mentioned that it would also be applicable (63%) or widely applicable (4%) in their countries].

6. Within this context, diagnostic upper gastrointestinal endoscopy should include gastric biopsies sampling (evidence level 4, recommendation grade D) [agree 93% (vote: a, 66%; b, 18%; c, 9%; d, 7%)].

NO WLE

ME-CHROMOENDOSCOPY OR NBI

Biopsies should be taken
A multicenter prospective study of the real-time use of narrow-band imaging in the diagnosis of premalignant gastric conditions and lesions

Accuracy, Sen, Spe NBI-targeted biopsies > WLE-biopsies
Importance of the “opportunistic screening in our “scenario” (low risk population) with a high quality endoscopy

New advanced imaging endoscopy (Magnification endoscopy with chromoendoscopy or Narrow Band Imaging with or without magnification) should be offered to improve the detection of precancerous conditions (CAG and GIM)
New imaging techniques, new treatment modalities (EMR, ESD)

2. Diagnosis
Advanced gastric cancer
early gastric cancer
Inmigrants (high risk regions) Family History

“Oportunistic screening” (EGD endoscopies)

Chronic Atrophic Gastritis (CAG)
Gastrointestinal metaplasia (GIM)

Displasia (Intraepithelial neoplasia) Adenocarcinoma


Detection of EGC will improve the survival rate of this cancer.
EARLY GASTRIC CANCER (EGC) DEFINITION

“EGC is a cancer in which tumor invasion is confined to the mucosa or submucosa (T1) regardless of the presence of lymph node metastasis”.

IMPORTANCE OF EARLY DETECTION

- Good prognosis
- Can be cured by minimally invasive approaches.
✓ 9.4% of EGC are missed during Upper gastrointestinal endoscopy

Is time for new advanced imaging technology?

EARLY GASTRIC CANCER (EGC) : WHITE LIGHT ENDOSCOPY

Improving the Endoscopic Detection Rate in Patients with Early Gastric Cancer. Moon HS. 2015
EARLY GASTRIC CANCER (EGC): WHITE LIGHT ENDOSCOPY
EARLY GASTRIC CANCER (EGC):

Dye-based image endoscopy

INDIGO CARMINE (0.2-0.4%): morphological characteristics of the surface mucosa

“Demarcation line”
EARLY GASTRIC CANCER (EGC) : ME- NBI

V (microvascular pattern)
- Regular
- Irregular
- Absent

S (microsurface pattern)
- Regular
- Irregular
- Absent

EARLY GASTRIC CANCER (EGC) : ME- NBI

White Light Endoscopy

- Sensitivity (SEN): 48%
- Specificity (SP): 67%

ME-NBI

- Sensitivity (SEN): 83%
- Specificity (SP): 96%

- WLI has poor performance in the diagnosis of early gastric cancer.
- ME-NBI is an effective tool for real-time endoscopic diagnosis of early gastric cancer.
EARLY GASTRIC CANCER (EGC) : CONFOCAL LASER ENDOMICROSCOPY (CLE)

X 1000 fold magnification
Real-time histology
EARLY GASTRIC CANCER (EGC) :
CONFOCAL LASER ENDOMICROSCOPY (CLE)
The diagnostic value of confocal laser endomicroscopy for gastric cancer and precancerous lesions among Asian population: a system review and meta-analysis

Hai-Ping Zhang, Sheng Yang, Wen-Hua Chen, Teng-Teng Hu & Jun Lin

Table 2. Subgroup analysis of CLE for diagnosing GC, GIM and GIN lesions.

<table>
<thead>
<tr>
<th></th>
<th>Pooled sensitivity</th>
<th>Heterogeneity</th>
<th>Pooled specificity</th>
<th>Heterogeneity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GC</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criteria in references [20, 32]</td>
<td>89% (84-94%)</td>
<td>$I^2 = 0.0%, p = 0.9832$</td>
<td>98% (96-99%)</td>
<td>$I^2 = 79.3%, p = 0.0002$</td>
</tr>
<tr>
<td>Criteria in other reference</td>
<td>93% (89-95%)</td>
<td>$I^2 = 44.1%, p = 0.1047$</td>
<td>100% (99-100%)</td>
<td>$I^2 = 81.6%, p = 0.0000$</td>
</tr>
<tr>
<td>Real-time diagnosis</td>
<td>Yes</td>
<td>93% (89-96%)</td>
<td>$I^2 = 0.0%, p = 0.5157$</td>
<td>100% (99-100%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>90% (86-93%)</td>
<td>$I^2 = 15.0%, p = 0.3121$</td>
<td>96% (93-98%)</td>
</tr>
<tr>
<td><strong>GIM</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criteria in reference 19</td>
<td>92% (90-94%)</td>
<td>$I^2 = 69.1%, p = 0.0035$</td>
<td>93% (92-95%)</td>
<td>$I^2 = 21.2%, p = 0.2680$</td>
</tr>
<tr>
<td>Criteria in other references</td>
<td>93% (89-95%)</td>
<td>$I^2 = 0.0%, p = 0.5546$</td>
<td>99% (96-99%)</td>
<td>$I^2 = 94.9%, p = 0.0000$</td>
</tr>
<tr>
<td>Real-time diagnosis</td>
<td>Yes</td>
<td>91% (89-93%)</td>
<td>$I^2 = 0.0%, p = 0.5492$</td>
<td>98% (97-98%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>94% (91-97%)</td>
<td>$I^2 = 77.4%, p = 0.0041$</td>
<td>94% (91-96%)</td>
</tr>
<tr>
<td><strong>GIN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criteria in reference [25]</td>
<td>77% (69-84%)</td>
<td>$I^2 = 76.1%, p = 0.0022$</td>
<td>87% (82-90%)</td>
<td>$I^2 = 83.1%, p = 0.0001$</td>
</tr>
<tr>
<td>Criteria in other references</td>
<td>84% (77-90%)</td>
<td>$I^2 = 50.5%, p = 0.0866$</td>
<td>100% (99-100%)</td>
<td>$I^2 = 86.3%, p = 0.0000$</td>
</tr>
<tr>
<td>Real-time diagnosis</td>
<td>Yes</td>
<td>84% (76-89%)</td>
<td>$I^2 = 0.0%, p = 0.5168$</td>
<td>99% (98-99%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>78% (70-84%)</td>
<td>$I^2 = 78.5%, p = 0.0003$</td>
<td>91% (87-93%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>sensibility</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gastric cancer</strong></td>
<td>89-93%</td>
<td>98-100%</td>
</tr>
<tr>
<td>Intestinal metaplasia</td>
<td>92-93%</td>
<td>93-99%</td>
</tr>
<tr>
<td>Intraepithelial neoplasia</td>
<td>77-84%</td>
<td>87-100%</td>
</tr>
</tbody>
</table>
Carefully inspection with routine WLE should be done to detect suspicious areas of malignancy especially in high risk patients (pre-malignant conditions).

In superficial neoplasms, New advanced imaging endoscopy (Magnification endoscopy with chromoendoscopy or Narrow Band Imaging, or CLE) is recommended to confirm the diagnosis and delimitate the extension, especially when local endoscopic resection is planned.
New imaging techniques, new treatment modalities (EMR, ESD)

3. Staging
Gastric cancer: ESMO–ESSO–ESTRO Clinical Practice Guidelines for diagnosis, treatment and follow-up

T. Waddell¹, M. Verheij², W. Allum³, D. Cunningham⁴, A. Cervantes⁵ & D. Arnold⁶*

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full blood count</td>
<td>Assess for iron deficiency anaemia</td>
</tr>
<tr>
<td>Renal and liver function</td>
<td>Assess renal and liver function to determine appropriate therapeutic options</td>
</tr>
<tr>
<td>Endoscopy and biopsy</td>
<td>Obtain tissue for diagnosis, histological classification and molecular biomarkers, e.g. HER2 status</td>
</tr>
<tr>
<td>CT thorax + abdomen ± pelvis</td>
<td>Staging of tumour—to detect local/distant lymphadenopathy and metastatic disease or ascites</td>
</tr>
<tr>
<td>EUS</td>
<td>Accurate assessment of T and N stage in potentially operable tumours</td>
</tr>
<tr>
<td></td>
<td>Determine the proximal and distal extent of tumour</td>
</tr>
<tr>
<td>Laparoscopy ± washings</td>
<td>Exclude occult metastatic disease involving peritoneum/diaphragm</td>
</tr>
<tr>
<td>PET, if available</td>
<td>May improve detection of occult metastatic disease in some cases</td>
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CT, computed tomography; EUS, endoscopic ultrasound; PET, positron emission tomography
### Table 1.
Diagnostic and staging investigations in gastric cancer

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CT, computed tomography; EUS, endoscopic ultrasound; PET, positron emission tomography
**CT (TAP)**
- Consider PET if CT-

**EUS**
- Locorregional staging/extent

**LAPAROSCOPY**
- Exclude occult metastatic disease in some cases
- (pre or during surgery)

- Rule out M+
IMPORTANCE OF T-STAGING OF GASTRIC CANCER

Risk of lymph node metastasis

- Tis: 0%<br>  - T1a: <5%<br>  - T1b: >8%<br>  - T2: 50%<br>  - T3: 67%<br>  - T4a: 75%<br>  - T4b: 85%

Endoscopic treatment vs. surgery

Neoadjuvancia T4b tto definitivo

F. Martínez de Juan, Instituto Valenciano de Oncología
# EUS T-STAGING. NORMAL GASTRIC WALL

<table>
<thead>
<tr>
<th>EUS Layer and Echo Features</th>
<th>Histologic Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>First (hyperechoic)</td>
<td>Superficial mucosa</td>
</tr>
<tr>
<td>Second (hypoechoic)</td>
<td>Deep mucosa</td>
</tr>
<tr>
<td>Third (hyperechoic)</td>
<td>Submucosa</td>
</tr>
<tr>
<td>Fourth (hypoechoic)</td>
<td>Muscularis propria</td>
</tr>
<tr>
<td>Fifth (hyperechoic)</td>
<td>Serosa</td>
</tr>
</tbody>
</table>
EUS T-STAGING. T1 (miniprobes 20 Hz)

uT1a

uT1b
EUS T-STAGING. T2 (radial EUS)

uT2

Courtesy of Fernando Martinez de Juan. Insituto Valenciano de Oncología (IVI)
EUS T-STAGING. T3 (radial EUS)

uT3

Subserosa

Courtesy of Fernando Martinez de Juan. Instituto Valenciano de Oncología (IVI)
EUS T-STAGING. T4b (radial EUS)

uT4b

Invade pancreas

Courtesy of Fernando Martinez de Juan. Insituto Valenciano de Oncología (IVI)
# EUS IN N- STAGING OF GASTRIC CANCER

## LN stations

<table>
<thead>
<tr>
<th>LYMPH NODE STATION (NO.)</th>
<th>DESCRIPTION</th>
<th>Location of Primary Tumor in Stomach</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Upper Third</td>
</tr>
<tr>
<td>1</td>
<td>Right paracardial</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Left paracardial</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Lesser curvature</td>
<td>1</td>
</tr>
<tr>
<td>4a</td>
<td>Short gastric</td>
<td>1</td>
</tr>
<tr>
<td>4b</td>
<td>Left gastroepiploic</td>
<td>1</td>
</tr>
<tr>
<td>4d</td>
<td>Right gastroepiploic</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Suprapyloric</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Infrapyloric</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Left gastric artery</td>
<td>2</td>
</tr>
<tr>
<td>8a</td>
<td>Anterior comm. hepatic</td>
<td>2</td>
</tr>
<tr>
<td>8p</td>
<td>Posterior comm. hepatic</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>Celiac artery</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Splenic hilum</td>
<td>2</td>
</tr>
<tr>
<td>11p</td>
<td>Proximal splenic</td>
<td>2</td>
</tr>
<tr>
<td>11d</td>
<td>Distal splenic</td>
<td>2</td>
</tr>
<tr>
<td>12a</td>
<td>Left hepatoduodenal</td>
<td>3</td>
</tr>
<tr>
<td>12b.p</td>
<td>Posterior hepatoduodenal</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>Retropancreatic</td>
<td>M</td>
</tr>
<tr>
<td>14v</td>
<td>Superior mesenteric vein</td>
<td>M</td>
</tr>
<tr>
<td>14a</td>
<td>Superior mesenteric artery</td>
<td>M</td>
</tr>
<tr>
<td>15</td>
<td>Middle colic</td>
<td>M</td>
</tr>
<tr>
<td>16al</td>
<td>Aortic hiatus</td>
<td>3</td>
</tr>
<tr>
<td>16a2,b1</td>
<td>Para-aortic, middle</td>
<td>M</td>
</tr>
<tr>
<td>16b2</td>
<td>Para-aortic, caudal</td>
<td>M</td>
</tr>
</tbody>
</table>

### Lymphatic drainage

- **N1**: Perigastric
- **N2**: Branches coeliac axis
# EUS IN N- STAGING OF GASTRIC CANCER

## LN stations

<table>
<thead>
<tr>
<th>LYMPH NODE STATION (NO.)</th>
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</tr>
<tr>
<td>1</td>
<td>Right paracardial</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Left paracardial</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Lesser curvature</td>
<td>1</td>
</tr>
<tr>
<td>4sa</td>
<td>Short gastric</td>
<td>1</td>
</tr>
<tr>
<td>4sb</td>
<td>Left gastric</td>
<td>1</td>
</tr>
<tr>
<td>4d</td>
<td>Right gastric</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Suprapyloric</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Infrapyloric</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Left gastric</td>
<td>2</td>
</tr>
<tr>
<td>8a</td>
<td>Anterior gastric</td>
<td>2</td>
</tr>
<tr>
<td>8p</td>
<td>Posterior comm. hepatic</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>Celiac artery</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Splenic hilum</td>
<td>2</td>
</tr>
<tr>
<td>11p</td>
<td>Proximal splenic</td>
<td>2</td>
</tr>
<tr>
<td>11d</td>
<td>Distal splenic</td>
<td>2</td>
</tr>
<tr>
<td>12a</td>
<td>Left hepatoduodenal</td>
<td>3</td>
</tr>
<tr>
<td>12b.p</td>
<td>Posterior hepatoduodenal</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>Retropancreatic</td>
<td>M</td>
</tr>
<tr>
<td>14v</td>
<td>Super.splenic</td>
<td>M</td>
</tr>
<tr>
<td>14a</td>
<td>Super.splenic</td>
<td>M</td>
</tr>
<tr>
<td>15</td>
<td>Middle splenic</td>
<td>M</td>
</tr>
<tr>
<td>16al</td>
<td>Aortic hilum</td>
<td>3</td>
</tr>
<tr>
<td>16a2,b1</td>
<td>Para-aortic</td>
<td>M</td>
</tr>
<tr>
<td>16b2</td>
<td>Para-aortic</td>
<td>M</td>
</tr>
</tbody>
</table>

## Lymphatic drainage

- **N1** Perigastric
- **D1**
- **N2**
- **D2** Branches coeliac axis

---

**N+**

**M+**
EUS IN N-STAGING OF GASTRIC CANCER

- Mediastinum
  - M+
- 1-12
  - N+
- 13-16
  - M+
Techniques of imaging of nodal stations of gastric cancer by endoscopic ultrasound. Sharma M. eusjournal 2018
EUS IN M- STAGING OF GASTRIC CANCER

uT4a N1M1?

Laparoscopy

Courtesy of Fernando Martinez de Juan. Insituto Valenciano de Oncología (IVI)
EUS IN M- STAGING OF GASTRIC CANCER

M+
Diagnostic accuracy of endoscopic ultrasonography (EUS) for the preoperative locoregional staging of primary gastric cancer (Review)

Mocellin S, Pasquali S

2015 meta-analysis, 66 studies, 7747 patients

T1-T2 vs T3-T4

Se: 86%
Sp: 90%

T1 vs T2

Se: 85%
Sp: 90%
Diagnostic accuracy of endoscopic ultrasonography (EUS) for the preoperative locoregional staging of primary gastric cancer (Review)

Mocellin S, Pasquali S

2015 meta-analysis, 66 studies, 7747 patients

T1a vs T1b

S: 87%
E: 75%
Diagnostic accuracy of endoscopic ultrasonography (EUS) for the preoperative locoregional staging of primary gastric cancer (Review)

Mocellin S, Pasquali S

N+ vs N-

S: 83%
E: 67%
EUS N-STAGING: RELIABILITY OF BIOPSY

FNA Lymph nodes:

- **Specificity** for adenocarcinoma is considered around 100%.
- **Sensitivity** varies from 87 to 100%.

**IS IT NECESSARY TO PUNCTURE ALL THE LYMPH NODES?**
EUS N-STAGING: RELIABILITY OF BIOPSY

Indications, results, and clinical impact of endoscopic ultrasound (EUS)-guided sampling in gastroenterology: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline – Updated January 2017

Authors
Jean-Marc Dumonceaux1, Pierre H. Deprez2, Christian Jenson2, Julio Iglesias-García3, Alberto Larghi5, Geoffrey Vanhoverset6, Guruprasad P. Atthar7, Paolo G. Arcidiacono8, Pedro Bentos9, Silvia Carrara9, László Czako9, Gloria Fernández-Esparrach12, Paul Fockens13, Àngels Ginés13, Roald F. Havre14, Cesare Hassan9, Peter Velmans15, Jeanin E. van Hooff14, Marcin Polkowski16

clinical practice guidelines

Gastric cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up†

E. C. Smyth1, M. Verheij2, W. Allum2, D. Cunningham4, A. Cervantes5 & D. Arnold6 on behalf of the ESMO Guidelines Committee

- No routine EUS-guide sampling.
- Only if impact in treatment decisions (prognosis)
EUS N-STAGING: RELIABILITY OF BIOPSY

- **Mortensen et al**: Prospective study of 62 patients. Therapeutic changed in 8% of the patients after exclusion of suspected metastasis lesions on CT-scan
- **Hassan et al**: retrospective study of 234 patients. Therapeutic management changed in 15% of the patients
- **Araujo et al**: Retrospective study of 115 patients. Therapeutic management changes in 23% of the patients

EUS staging, looking for distant lesions will **change your therapeutic management in 8 to 23%** finding lesion which will change the status of the patient (local disease to metastatic disease)
EUS N-STAGING: ELASTOSONOGRAPHY

Normal LN

inflammatory LN

Malignant
   (central necrosis)

Malignant
   (homogeneous)
US elastography is superior compared to conventional B-mode imaging and appears to be able to distinguish benign from malignant lymph nodes.

But...EUS elastography is not considered a modality that can replace biopsy. It should be considered as complementary to other imaging techniques rather than a replacement for tissue confirmation. EUS-e has the potential to be useful for target selection prior to endosonographic guided tissue sampling.
ELASTOGRAPHY VS CONVENTIONAL B-MODE:

SEN: 83.6%
SPE: 95% ≥ SEN: 78.6%
SPE: 50%
- **EUS staging** is **more reliable than others techniques** to differentiate T1 from T2 and superficial versus advanced gastric tumors but has a moderate/low sensibility and specificity to differentiate between mucosal and submucosal in T1 cancers or in lymph node involvement.

- EUS staging **will not change the therapeutic management** in most cases. Neoadjuvant chemotherapy is already decided.

- But... EUS staging, looking for distant lesions will **change the therapeutic management in 8 to 23%** finding lesion which will change the status of the patient (local disease to metastatic disease).
New imaging techniques, new treatment modalities (EMR, ESD)

4. Treatment
Gastric cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up

E. C. Smyth¹, M. Verheij², W. Allum³, D. Cunningham⁴, A. Cervantes⁵ & D. Arnold⁶ on behalf of the ESMO Guidelines Committee

Operable stage T¹NO

- Consider endoscopic/limited resection

Operable stage >T¹ NO

Preferred pathway

- Preoperative chemotherapy

- Surgery

- Adjuvant chemoradiotherapy

- Adjuvant chemotherapy

- Surgery

- HER2-negative: Platinum+ fluoropyrimidine-based doublet or triplet regimen

- HER2-positive: Trastuzumab + CF/CX

Inoperable or metastatic

- Palliative chemotherapy

- Consider clinical trials of novel agents

Re-assess

Postoperative chemotherapy

Second-line chemotherapy

Best supportive care if unfit for treatment
An endoscopic treatment is a local treatment for lesion without lymph nodes metastasis
Guideline

Guidelines for endoscopic submucosal dissection and endoscopic mucosal resection for early gastric cancer*

Hiroyuki Ono,1,2 Kenshi Yao,1,2 Mitsuhiro Fujishiro,1,2 Ichiro Oda,1,2 Satoshi Nimura,2 Naohisa Yahagi,1,2 Hiroyasu Iishi,1,2 Masashi Oka,1,2 Yoichi Ajioka,2 Masao Ichinose1 and Toshiyuki Matsui1

1Japan Gastroenterological Endoscopy Society, Tokyo, and 2Japanese Gastric Cancer Association, Kyoto, Japan

Guideline

Endoscopic submucosal dissection: European Society of Gastrointestinal Endoscopy (ESGE) Guideline

Authors

Pedro Pimentel-Nunes1, Mário Dinis-Ribeiro1, Thierry Ponchon2, Alessandro Repici3, Michael Vieth4, Antonella De Ceglie5, Arnaldo Amato6, Frieder Berr7, Pradeep Bhandari8, Andrzej Bialek9, Massimo Conio10, Jelle Haringma11, Cord Langner12, Søren Meisner13, Helmut Messmann14, Mario Morino15, Horst Neuhaus16, Hubert Piessevaux17, Massimo Rugge18, Brian P. Saunders19, Michel Robaszkiewicz20, Stefan Seewald21, Sergey Kashin22, Jean-Marc Dumonceau23, Cesare Hassan24, Pierre H. Deprez25
ESGE recommends endoscopic resection for the treatment of *gastric superficial neoplastic lesions* that possess a very low risk of lymph node metastasis.
Endoscopy in gastric cancer: new treatment modalities (EMR, ESD)

**INDICATIONS FOR ENCOSCOPIC RESECTION?**

ESGE recommends endoscopic resection for the treatment of *gastric superficial neoplastic lesions* that possess a **very low risk of lymph node metastasis**

**Tumor-related factors**
- Grade of differentiation (differentiated/diffuse)
- Size (horizontal expansion)
- Depth (vertical invasion)
- Morphology (ulcerated/non-ulcerated)
- Lympho-Vascular invasion (+/-)

**Technique-related factors**
- Resection (“en bloc” vs piecemeal)
- Margins (free)

**Final Objective:** Negligible Risk of lymph node metastasis after resection
Guidelines for endoscopic submucosal dissection and endoscopic mucosal resection for early gastric cancer

Hiroyuki Ono,1,2 Kenshi Yao,1,2 Mitsuhiro Fujishiro,1,2 Ichiro Oda,1,2 Satoshi Nimura,2 Naohisa Yahagi,1,2 Hiroyasu Iishi,1,2 Masashi Oka,1,2 Yoichi Ajioka,2 Masao Ichinose1 and Toshiyuki Matsui1

1Japan Gastroenterological Endoscopy Society, Tokyo, and 2Japanese Gastric Cancer Association, Kyoto, Japan

**ABSOLUTE INDICATIONS**

- Macroscopically intramucosal (cT1a) differentiated carcinomas measuring less than 2cm

**EXPANDED INDICATIONS**

- Macroscopically intramucosal (cT1a) UL-, differentiated carcinomas >2cm, LV-
- Macroscopically intramucosal (cT1a) UL+, differentiated carcinomas <3cm, LV-
- Macroscopically intramucosal (cT1a) UL-, undifferentiated carcinomas <2cm, LV-

Differentiated-type adenocarcinoma with superficial submucosal invasion (sm1 ≤ 500μm), and size ≤3cm
EVALUATION BEFORE RESECTION (PREOPERATIVE DIAGNOSIS)
IS ESD OR EMR INDICATED?

Inspección: Morphology

JAPANESE CLASSIFICATION

Type 0-I, Protruding (Polyp-like)

Type 0-II, Superficial (Gastritis-like)

Type 0-III, Excavated (Ulcer-like)

90-95% SM+

80-85% IE
“Determination of the depth of invasion by EGC is generally carried out using conventional endoscopy with additional indigo-carmine dye spraying being recommended”
DEPTH OF INVASION

Characteristic **endoscopic features** of **mucosal** cancer

- Smooth surface protrusion
- Shallow and even depression
- Slight marginal elevation

Guidelines for endoscopic submucosal dissection and endoscopic mucosal resection for early gastric cancer. Ono 2015
DEPTHD OF INVASION

Characteristic endoscopic features of **submucosal invasive** cancer

Irregular/nodular surface protrusion

Deep ulcer with marked marginal elevation

Fusion of converging folds
Abrupt cutting of converging folds
Clubbing of converging folds.

Guidelines for endoscopic submucosal dissection and endoscopic mucosal resection for early gastric cancer. Ono 2015
3) DEPTH OF INVASION

- High quality endoscopy ideally with contrast or digital chromoendoscopy (NBI)
- Experienced endoscopist
EVALUATION BEFORE RESECTION
(PREOPERATIVE DIAGNOSIS)
IS ESD OR EMR INDICATED?

DEPTH OF INVASION
EVALUATION BEFORE RESECTION
(PREOPERATIVE DIAGNOSIS)
IS ESD OR EMR INDICATED?

DEPTH OF INVASION
ROLE FOR EUS???

Comparison of endoscopic ultrasonography and conventional endoscopy for prediction of depth of tumor invasion in early gastric cancer Choi 2010 Endoscopy
EVALUATION BEFORE RESECTION
(PREOPERATIVE DIAGNOSIS)
IS ESD OR EMR INDICATED?

T1a (m) vs T1b (Sbm)

S: 87%
E: 75%

"Over and under diagnosis"
When difficulties are encountered in determining the depth of invasion using conventional endoscopy alone, endoscopic ultrasonography may be useful as an additional diagnostic modality. USE in EGC is not necessary....Only for selected cases

3) DEPTH OF INVASION
ROLE FOR EUS???

EUS in EGC may not be necessary routinely......
3) DEPTH OF INVASION

EVALUATION BEFORE RESECTION (PREOPERATIVE DIAGNOSIS) IS ESD OR EMR INDICATED?

But...histopathological analysis of endoscopically resected specimens is the gold standard reference for tumor staging.
ENDOSCOPICAL MUCOSAL RESECTION (EMR) VS ENDOSCOPICAL SUBMUCOSAL DISECTION (ESD)
ENDOSCOPIC MUCOSAL RESECTION: TECHNIQUE

STANDAR

[Image of an endoscopic view of a mucosal lesion]
ENDOSCOPIC SUBMUCOSAL DISSECTION

Courtesy of Dr. Juan Carlos Marín (H.12 Octubre Madrid)
META-ANALYSIS

Endoscopic submucosal dissection vs endoscopic mucosal resection for early gastric cancer: A meta-analysis

Antonio Facciorusso, Matteo Antonino, Marianna Di Maso, Nicola Muscatiello
### EMR/ESD: DURATION OF THE PROCEDURE

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>ESD</th>
<th>MEAN</th>
<th>SD</th>
<th>Total</th>
<th>EMR</th>
<th>MEAN</th>
<th>SD</th>
<th>Total</th>
<th>Std. mean difference</th>
<th>Year</th>
</tr>
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<tbody>
<tr>
<td>Oka</td>
<td>84.4</td>
<td>55.3</td>
<td>195</td>
<td>12.6</td>
<td>9.3</td>
<td>825</td>
<td>25.50%</td>
<td>2.81 [2.61, 3.01]</td>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>Nakamoto</td>
<td>84.4</td>
<td>61.9</td>
<td>122</td>
<td>17.2</td>
<td>18.5</td>
<td>80</td>
<td>25.20%</td>
<td>1.35 [1.04, 1.66]</td>
<td>2009</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>33.6</td>
<td>16.6</td>
<td>243</td>
<td>24.3</td>
<td>16.2</td>
<td>103</td>
<td>25.40%</td>
<td>0.56 [0.33, 0.80]</td>
<td>2009</td>
<td></td>
</tr>
<tr>
<td>Hoteya 2010</td>
<td>115.8</td>
<td>48.8</td>
<td>40</td>
<td>25.3</td>
<td>11.6</td>
<td>22</td>
<td>23.90%</td>
<td>2.24 [1.58, 2.90]</td>
<td>2010</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td></td>
<td></td>
<td>1030</td>
<td>100.00%</td>
<td>1.73 [0.52, 2.95]</td>
<td>2010</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Heterogeneity: $\tau^2 = 1.51; \chi^2 = 216.15, \text{df} = 3 (P < 0.00001); I^2 = 99\%$

Test for overall effect: $Z = 2.79 (P = 0.005)$
### EMR/ESD: “EN BLOC RESECTION RATE”

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>ESD Events</th>
<th>Total Events</th>
<th>ESD Total</th>
<th>EMR Events</th>
<th>Total Events</th>
<th>EMR Total</th>
<th>Weight</th>
<th>M-H, fixed, 95%CI</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oka</td>
<td>162</td>
<td>195</td>
<td>347</td>
<td>825</td>
<td>36.80%</td>
<td>6.76</td>
<td>4.54, 10.08</td>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>Oda</td>
<td>281</td>
<td>303</td>
<td>230</td>
<td>411</td>
<td>23.20%</td>
<td>10.05</td>
<td>6.25, 16.17</td>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>Hoteya</td>
<td>294</td>
<td>303</td>
<td>219</td>
<td>350</td>
<td>9.90%</td>
<td>19.54</td>
<td>9.73, 39.26</td>
<td>2007</td>
<td></td>
</tr>
<tr>
<td>Nakamoto</td>
<td>115</td>
<td>122</td>
<td>43</td>
<td>80</td>
<td>4.90%</td>
<td>14.14</td>
<td>5.86, 34.10</td>
<td>2009</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>233</td>
<td>243</td>
<td>80</td>
<td>103</td>
<td>7.60%</td>
<td>6.70</td>
<td>3.06, 14.68</td>
<td>2009</td>
<td></td>
</tr>
<tr>
<td>Catalano</td>
<td>11</td>
<td>12</td>
<td>26</td>
<td>36</td>
<td>1.80%</td>
<td>4.23</td>
<td>0.48, 37.17</td>
<td>2009</td>
<td></td>
</tr>
<tr>
<td>Watanabe</td>
<td>194</td>
<td>219</td>
<td>66</td>
<td>146</td>
<td>14.80%</td>
<td>9.41</td>
<td>5.54, 15.96</td>
<td>2010</td>
<td></td>
</tr>
<tr>
<td>Hoteya 2010</td>
<td>38</td>
<td>40</td>
<td>9</td>
<td>22</td>
<td>1.00%</td>
<td>27.44</td>
<td>5.24, 143.84</td>
<td>2010</td>
<td></td>
</tr>
<tr>
<td><strong>Total (95%CI)</strong></td>
<td><strong>1473</strong></td>
<td><strong>1973</strong></td>
<td><strong>100.00%</strong></td>
<td><strong>9.69 [7.74, 12.13]</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total Events</td>
<td><strong>1328</strong></td>
<td><strong>1020</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Heterogeneity: $\chi^2 = 10.67$ df = 7 ($P = 0.15$); $I^2 = 34$
Test for overall effect: $Z = 19.84$ ($P < 0.00001$)
### EMR/ESD: COMPLETE HISTOLOGIC RESECTION RATE

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Events ESD</th>
<th>Total ESD</th>
<th>Events EMR</th>
<th>Total EMR</th>
<th>Weight</th>
<th>Odds ratio IV, random, 95%CI</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oka</td>
<td>162</td>
<td>195</td>
<td>195</td>
<td>825</td>
<td>12.60%</td>
<td>15.86 [10.55, 23.83]</td>
<td>2006</td>
</tr>
<tr>
<td>Odashima</td>
<td>43</td>
<td>57</td>
<td>41</td>
<td>80</td>
<td>11.40%</td>
<td>2.92 [1.39, 6.16]</td>
<td>2006</td>
</tr>
<tr>
<td>Oda</td>
<td>223</td>
<td>303</td>
<td>251</td>
<td>411</td>
<td>12.90%</td>
<td>1.78 [1.29, 2.46]</td>
<td>2006</td>
</tr>
<tr>
<td>Catalano</td>
<td>11</td>
<td>12</td>
<td>20</td>
<td>36</td>
<td>5.50%</td>
<td>8.80 [1.02, 75.55]</td>
<td>2009</td>
</tr>
<tr>
<td>Nakamoto</td>
<td>113</td>
<td>122</td>
<td>30</td>
<td>80</td>
<td>11.00%</td>
<td>20.93 [9.25, 47.32]</td>
<td>2009</td>
</tr>
<tr>
<td>Min</td>
<td>216</td>
<td>243</td>
<td>78</td>
<td>103</td>
<td>12.00%</td>
<td>2.56 [1.40, 4.68]</td>
<td>2009</td>
</tr>
<tr>
<td>Hoteya 2010</td>
<td>32</td>
<td>40</td>
<td>9</td>
<td>22</td>
<td>9.50%</td>
<td>5.78 [1.83, 18.25]</td>
<td>2010</td>
</tr>
<tr>
<td>Total (95%CI)</td>
<td>1495</td>
<td>2053</td>
<td>100.00%</td>
<td>5.66 [2.92, 10.96]</td>
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<td></td>
</tr>
<tr>
<td>Total events</td>
<td>1227</td>
<td>867</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Heterogeneity: $\tau^2 = 0.85; \chi^2 = 99.48 \text{ df } 8 \ (P < 0.00001); I^2 = 92$

Test for overall effect: $Z = 5.14 \ (P < 0.00001)$

---

EMR VS ESD

ESD
## EMR/ESD: LOCAL RECURRENCE RATE

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Events</th>
<th>Total</th>
<th>Events</th>
<th>Total</th>
<th>Weight</th>
<th>M-H, fixed, 95%CI</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oka</td>
<td>0</td>
<td>195</td>
<td>31</td>
<td>825</td>
<td>9.30%</td>
<td>0.06 [0.00, 1.06]</td>
<td>2006</td>
</tr>
<tr>
<td>Oda</td>
<td>6</td>
<td>303</td>
<td>27</td>
<td>411</td>
<td>17.30%</td>
<td>0.29 [0.12, 0.70]</td>
<td>2006</td>
</tr>
<tr>
<td>Hoteya</td>
<td>0</td>
<td>304</td>
<td>13</td>
<td>350</td>
<td>9.70%</td>
<td>0.04 [0.00, 0.69]</td>
<td>2007</td>
</tr>
<tr>
<td>Nakamoto</td>
<td>0</td>
<td>122</td>
<td>14</td>
<td>80</td>
<td>13.40%</td>
<td>0.02 [0.00, 0.32]</td>
<td>2009</td>
</tr>
<tr>
<td>Min</td>
<td>0</td>
<td>243</td>
<td>0</td>
<td>103</td>
<td>Not estimable</td>
<td></td>
<td>2009</td>
</tr>
<tr>
<td>Catalano</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>36</td>
<td>Not estimable</td>
<td></td>
<td>2009</td>
</tr>
<tr>
<td>Watanabe</td>
<td>5</td>
<td>219</td>
<td>39</td>
<td>146</td>
<td>35.30%</td>
<td>0.06 [0.02, 0.17]</td>
<td>2010</td>
</tr>
<tr>
<td>Hoteya 2010</td>
<td>0</td>
<td>40</td>
<td>2</td>
<td>22</td>
<td>2.40%</td>
<td>0.10 [0.00, 2.21]</td>
<td>2010</td>
</tr>
<tr>
<td>Tanabe</td>
<td>1</td>
<td>421</td>
<td>15</td>
<td>359</td>
<td>12.50%</td>
<td>0.05 [0.01, 0.42]</td>
<td>2014</td>
</tr>
</tbody>
</table>

**Total (95%CI)**: ESD 1859 2332 100.00% 0.09 [0.05, 0.17]  
**Total events**: ESD 12 EMR 141  
**Heterogeneity**: $\chi^2 = 8.48$ df = 6 ($P = 0.21$); $I^2 = 29\%$  
**Test for overall effect**: $Z = 8.18$ ($P < 0.00001$)
Perforation rate

Favours EMR...... but most fo perforations in ESD group are managed conservatory without the need of surgery
Bleeding rate

Favours EMR...... but non significant difference
Long-term follow-up after endoscopic resection of gastric superficial neoplastic lesions in Portugal

<table>
<thead>
<tr>
<th>Resection</th>
<th>R0 RESECTION RATE</th>
<th>RECURRENCE RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMR</td>
<td>54%</td>
<td>15%</td>
</tr>
<tr>
<td>ESD</td>
<td>91%</td>
<td>4%</td>
</tr>
</tbody>
</table>

But....... no differences in survival
Endoscopic submucosal dissection: European Society of Gastrointestinal Endoscopy (ESGE) Guideline

ESGE recommends endoscopic resection for the treatment of gastric superficial neoplastic lesions that possess a very low risk of lymph node metastasis (strong recommendation, high quality evidence).

EMR is an acceptable option for lesions smaller than 10–15 mm with a very low probability of advanced histology (Paris 0-IIa). However, ESGE recommends ESD as treatment of choice for most gastric superficial neoplastic lesions (strong recommendation, moderate quality evidence).

- <10-15mm
- Low probability of advanced histology (0-IIa)

Treatment of choice
ESD should be the first-line therapy for all potentially endoscopically resectable superficial gastric neoplasia. Surgery can be reserved and used as a rescue therapy.
Thank you