Endoscopic resection of gastrointestinal lesions and challenging post-treatment conditions

Alexander Meining
When is endoscopic resection appropriate?

All adenomas (low-grade and high-grade)

pT1-cancers, if …

„Low risk“-category

► L0/V0

► G1/ G2

► SM-infiltration: <1500µm (colorectal), <500/1000 µm (stomach, Barretts)

► R0 possible!?
The ideal situation

To accurately predict histology by endoscopy BEFORE resection!

Surgery or endoscopic resection (which type)?

⇒ Paris-Classification
⇒ NICE/ JNET-Classification
JNET-Classification as a guidance for adequate therapy

<table>
<thead>
<tr>
<th></th>
<th>Type 1</th>
<th>Type 2A</th>
<th>Type 2B</th>
<th>Type 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessel pattern</td>
<td>Invisible*¹</td>
<td>Regular caliber</td>
<td>Variable caliber</td>
<td>Loose vessel areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Regular distribution (meshed/spiral pattern)*²</td>
<td>Irregular distribution</td>
<td></td>
</tr>
<tr>
<td>Surface pattern</td>
<td>Regular dark or white spots</td>
<td>Regular (tubular/branched/papillary)</td>
<td>Irregular or obscure</td>
<td>Amorphous areas</td>
</tr>
<tr>
<td></td>
<td>Similar to surrounding normal mucosa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most likely histology</td>
<td>Hyperplastic polyp/ Sessile serrated polyp</td>
<td>Low grade intramucosal neoplasia</td>
<td>High grade intramucosal neoplasia/ Shallow submucosal invasive cancer *³</td>
<td>Deep submucosal invasive cancer</td>
</tr>
<tr>
<td>Endoscopic image</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
</tbody>
</table>

*¹ If visible, the caliber in the lesion is similar to surrounding normal mucosa.
*² Micro-vessels are often distributed in a punctate pattern and well-ordered reticular or spiral vessels may not be observed in depressed lesions.
*³ Deep submucosal invasive cancer may be included.
Paris-classification (endoscopy or surgery?)

- **Ip**
- **Is**
- **IIa**
- **IIb**
- **IIc**
- **III**

- Epithelium
- Neoplasia
- Submucosa

IIa+c  IIc+a  IIc+III
Paris-classification (colon): ESD or EMR

- Epithelium
- Neoplasia
- Submucosa

IIa

- LST-granular homogenous
- LST-granular nodular mixed
- LST-nongranular flat elevated
- LST-nongranular pseudodepressed
Endoscopic Resection

EMR

fast, safe
piece meal and R0?

ESD

R0, en bloc
time-consuming, risky

Ono, H. et al., 2001
Problems of standard endoscopic therapy

**PIECE-MEAL-RESECTION!**

R0?

⇒ Endoscopic judgement enough?
⇒ R0 for depth of resection sufficient? Level of SM-infiltration?
⇒ Difficulties of histological assessment without adequate fixation and orientation of specimen
Clinical outcome of endoscopic submucosal dissection versus endoscopic mucosal resection of large colorectal tumors as determined by curative resection

Yutaka Saito · Masakatsu Fukuzawa · Takahisa Matsuda · Shusei Fukunaga · Taku Sakamoto · Toshio Uraoka · Takeshi Nakajima · Hisatomo Ikehara · Kuang-I Fu · Takao Itoi · Takahiro Fujii

Total of 553 large colorectal tumors (≥ 20mm) were resected endoscopically

29 lesions requiring surgery after endoscopic treatment because of non-curative resections and 151 conventional EMR lesions for which follow-up colonoscopy examinations could not be carried out or ascertained at NCCH were excluded

145 lesions were treated by ESD

228 lesions were treated by conventional EMR
<table>
<thead>
<tr>
<th></th>
<th>EMR/EPMR</th>
<th>ESD</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lesions</td>
<td>228 (74/154)</td>
<td>145</td>
<td></td>
</tr>
<tr>
<td>Endoscopic follow-up times (mean ± SD; number)</td>
<td>2.4 ± 1.6</td>
<td>2.0 ± 1.1</td>
<td>NS</td>
</tr>
<tr>
<td>(range)</td>
<td>(1–8)</td>
<td>(1–5)</td>
<td></td>
</tr>
<tr>
<td>Endoscopic follow-up periods (mean ± SD; months)</td>
<td>26 ± 17</td>
<td>20 ± 13</td>
<td>NS</td>
</tr>
<tr>
<td>(range)</td>
<td>(6–68)</td>
<td>(6–61)</td>
<td></td>
</tr>
<tr>
<td>En bloc resection (%)</td>
<td>74 (33%)</td>
<td>122 (84%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Recurrence rate (%)</td>
<td>33 (14%)</td>
<td>3 (2%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>En bloc/piecemeal recurrences</td>
<td>2/31</td>
<td>0/3</td>
<td></td>
</tr>
<tr>
<td>Complications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perforation</td>
<td>3 (1.3%)</td>
<td>9 (6.2%)</td>
<td>NS</td>
</tr>
<tr>
<td>Delayed bleeding</td>
<td>7 (3.1%)</td>
<td>2 (1.4%)</td>
<td>NS</td>
</tr>
<tr>
<td>Procedure time (mean ± SD; min)</td>
<td>29 ± 25</td>
<td>108 ± 7</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>(range)</td>
<td>(3–120)</td>
<td>(15–360)</td>
<td></td>
</tr>
</tbody>
</table>

EMR endoscopic mucosal resection; EPMR endoscopic piecemeal mucosal resection; ESD endoscopic submucosal dissection; SD standard deviation; NS not significant

Saito et al Surg Endosc 2011
FTRD (Ovesco) for recurrend lesions that cannot be treated by standard techniques?
Recurrent/ residual adenoma on a scar: „non-lifting-sign“

Schmidt et al., GUT 2017: 75-80% R0
In case of doubt – take it out (by endoscopy)?
T1sm2-cancer, R0-resection
EMR, ESD, surgery, or ...

- Rectal-cancer pT1, SM1, V0, L0, R0, GII
Gastric FTRD for recurrent lesion, post-surgery?
Recurrent/ residual adenoma on a scar: „non-lifting-sign“
BE: multifocal small lesions in a large Barrett segment!
EMR or ESD

- EMR: easy, low risk, can be combined with RFA/ APC
- ESD: resection of whole Barrett’s segment is possible, better R0-status, deeper in the submucosal layer, better histology,

Terheggen et al. Gut 2016
Randomized study: ESD as effective as EMR

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Follow-up of &gt;30 days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ESD</td>
</tr>
<tr>
<td>Included patients</td>
<td>20</td>
</tr>
<tr>
<td>Patients referred to elective surgery</td>
<td>4</td>
</tr>
<tr>
<td>Patients lost to follow-up after first follow-up endoscopy</td>
<td>0</td>
</tr>
<tr>
<td>Patients under continuous endoscopic surveillance</td>
<td>15</td>
</tr>
<tr>
<td>Mean period of follow-up (±SD), months</td>
<td>22.6 ±7.8</td>
</tr>
<tr>
<td>Complete remission of neoplasia</td>
<td>15/16</td>
</tr>
<tr>
<td>After initial resection</td>
<td>16/16</td>
</tr>
<tr>
<td>After single re-treatment of residual neoplasia</td>
<td>6/16</td>
</tr>
<tr>
<td>Complete remission of intestinal neoplasia</td>
<td>10</td>
</tr>
<tr>
<td>RFA for residual intestinal metaplasia</td>
<td>8</td>
</tr>
<tr>
<td>Successful eradication of intestinal metaplasia</td>
<td>2</td>
</tr>
<tr>
<td>Treatment ongoing</td>
<td>0</td>
</tr>
<tr>
<td>Delayed AEs</td>
<td>1</td>
</tr>
<tr>
<td>Recurrent/metachronous neoplasia</td>
<td>0</td>
</tr>
</tbody>
</table>

AE, adverse event; EMR, endoscopic mucosal resection; ESD, endoscopic submucosal dissection; RFA, radiofrequency ablation.
RFA of residual Barrett-segment

Multimodal endoscopic therapy following “optimal diagnosis”

- No visible changes/ flat mucosa: random biopsy
- Visible nodule? Irregularity?
  - => targeted plus random biopsy, followed by EUS (?), then ...
  - => EMR of visible lesion for further grading & determination of infiltration depth
- => RFA/ APC of residual Barrett

Phoa et al. Gut 2016
Multicenter, long term FU
Conclusion

► Endoscopic resection even of early cancers is today’s standard

► Different techniques (EMR, ESD, FTR) depending on lesion size, morphology and “suspected histology”

► En-bloc is ideal but not always feasible

⇒ Histological risk assessment after resection?

⇒ Infiltration depths?

⇒ Buried glands, “hidden” remnants?
THANK YOU FOR YOUR ATTENTION!