New trends in gastric cancer surgery

A cura di: Francesco Caracciolo e Francesco G. Biondo
Early Gastric Cancer (EGC) with 5-years survival rates exceeding 90% now accounts for nearly 60% to 70% of all gastric cancers treated at major institution in Japan.
The frequency of lymph node metastasis is less than 5% in patients with mucosal gastric cancer and 16% in patients with sub-mucosal gastric cancer
Therefore, 84% to 95% of patients with early gastric cancer could:

1. avoid lymphadenectomy and
2. preserve a large volume of stomach
Nevertheless, 

**D2 lymphadenectomy**

with resection of at least two – thirds of the stomach

has been the mainstay of treatment

for every stage of gastric cancer, *including EGC*

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Post gastrectomy syndrome is inevitable after surgery.

Most of the symptoms resolve with time, though some patients suffer for prolonged periods.
The new surgical strategies preserve patients’ quality of life, maintaining a high level of radicality, by employing a function-preserving operation, which prevents post-gastrectomy syndrome.
There are various kinds of function-preserving operations, such as those:

1. reducing the extent of gastrectomy
2. providing nerve preservation
3. sphincter preservation
4. formation of a new stomach by jejunal interposition
Laparoscopic function preserving gastrectomy with SN basin dissection

Wedge resection with 1 basin dissection

Sleeve resection with 2 basin dissection
Evaluation of preserved function is not satisfactory up-to now, because there is no gold standard for measuring gastrointestinal motor function and patients’ quality of life, but pylorus-preserving distal gastrectomy (PPG) has frequently been performed on patients with early gastric cancer in Japan to prevent the post-gastrectomy syndrome seen after conventional distal gastrectomy (CDG).
The long-term postoperative’ quality of life (QOL) and gastric emptying function in patients after PPG has not been assessed in detail, but it seems that the only weak point with the PPG procedure was that it produce a feeling of epigastric fullness due to retention of contents in the residual stomach.
Thus the only functional disadvantage of the PPG procedure is the sensation of epigastric fullness and gastric stasis due to delayed gastric emptying of semisolid diet.
Recently the use of mosapride citrate on patients after vagal nerve preserving distal gastrectomy seems to improve abdominal fullness due to the post-prandial stasis in the substitute stomach, contributing to the improvement of QOL of patients after this kind of operation.
Despite the significant clinical contribution of the sentinel lymph node concept to the effective treatment in melanoma and breast cancers, most surgeons have reserved judgment on its applicability to upper gastrointestinal malignancies, mainly due to multidirectional lymphatic flow from the gastrointestinal tract and the widespread and random patterns of lymph node metastasis in GI malignancies.
Anatomic skip metastasis were found in 20 to 30% of gastric cancers in a retrospective analysis of the location of solitary metastasis.
But in the past 5 years, several single institutional studies have described the value of the sentinel lymph node concept in patients with gastric cancer.
### Single institutional results of sentinel lymph node mapping for gastric cancer

**Source:** Kitagawa et al., 2005 (16)

<table>
<thead>
<tr>
<th>Author</th>
<th>Year and Publication</th>
<th>Method</th>
<th>Total</th>
<th>Detection rate</th>
<th>Sensitivity</th>
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<td>Kitagawa et al.</td>
<td>2000, Surg Clin N Am</td>
<td>RI</td>
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<td>Hiratsuka et al.</td>
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<td>Yasuda et al.</td>
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<td>Kitagawa et al.</td>
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<td>Carlini et al.</td>
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<td>Hayashi et al.</td>
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<td>Miwa et al.</td>
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<td>Gretschel et al.</td>
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**Legend:**
- RI—radioisotopic.

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Lymphatic drainage routes from the lower stomach are relatively complicated: the distribution of sentinel lymph nodes is unique to each patient and is not predictable without actual lymphatic mapping.
Actually the dual tracer method using radioactive colloid and dye is recommended for detection of sentinel lymph nodes in gastric cancer.
1. **The radioactive colloid**

   is injected in the sub mucosal layer of the primary lesion

   the day before surgery,

   using an endoscopic puncture needle

2. **Blue dye**

   is injected using intra operative endoscopy

   in the same manner used for the radioactive tracer
Two type of sentinel lymph node sampling procedures for gastric cancer have been described:

- The pickup method is the same used for breast cancer and melanoma;
- Sentinel lymphatic basin dissection is a focused lymph node dissection of hot and blue nodes.
The lymphatic basin concept has been introduced by MIWA in 2003 dividing the perigastric lymph node into 5 lymphatic basins along:

1. left gastric artery (LGA)
2. right gastric artery (RGA)
3. right gastro-epiploic artery (RGEA)
4. left gastro-epiploic artery (LGEA)
5. posterior artery (PGA)
Lymphatic basin:
Distribution of **hot nodes** (closed circle)
and non-SLN (open circle) in the lymphatic basin

Prior reports have demonstrated that sentinel lymphatic basin contained truly positive nodes, even in cases with false negative sentinel node biopsy results.

*Clinically T1N0 gastric cancer* is a good place to start to try to modify the surgical treatment.
Really in these cases, micro metastasis tend to be limited within the sentinel lymph node basin, so the basins are good targets for selective lymphadenectomy.
Gastric cancer (c T1 N0 < 4 cm)

Current approaches based on SN navigation

Focused SN dissection (dual tracer method)

Open or Laparoscopic

SN identification on the back table

Intra-operative histological examination of SNs

Negative SN
- Function preserving surgery
  1. Pylorus preserving gastrectomy
  2. Segmental resection
  3. Wedge resection
  4. Limited proximal gastrectomy

Positive SN
- 1. Conventional D2 gastrectomy

Laparoscopic function preserving gastrectomy with SN basin dissection
The patients with positive sentinel lymph nodes after selective dissection of sentinel basin can be treated with conventional radical surgery.
Furthermore in the patients with negative sentinel lymph nodes after selective basin dissection laparoscopic local resection is theoretically feasible for curative treatment.