Staging of Stomach Cancer

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Stomach Cancer – presenting symptoms

- Weight loss
- Abdominal pain
- Nausea
- Difficulty swallowing
- Dark stool
- Fullness/bloating
Diagnosis of gastric cancer

• Upper endoscopy
  • Ulcerated mass
  • Benign appearing ulcer, but proven malignant on biopsy
  • In diffuse cancers, endoscopy may not show any obvious abnormalities (linitis plastica)

• Biopsy
  • Adenocarcinoma

• Barium study (rare)
Why is staging important?

Staging correlates with prognosis

Percent of Cases by Stage

- Localized (27%): Confined to Primary Site
- Regional (28%): Spread to Regional Lymph Nodes
- Distant (35%): Cancer Has Metastasized
- Unknown (10%): Unstaged

5-Year Relative Survival

- Localized: 67.2%
- Regional: 30.7%
- Distant: 5.2%
- Unstaged: 22.1%

SEER Database 2007-2013
Why is staging important?

Staging guides treatment decisions

- Treatment modalities (surgery, chemotherapy, radiation)
- Sequence of therapies
- Patients without metastases who are eligible for surgery have potentially curable disease
- Patients with metastatic disease are referred for palliative therapy
Staging of gastric cancer – TNM criteria

- **Tumor**
  - Depth of tumor invasion in the wall of the stomach
- **Node**
  - Number of regional lymph nodes involved
- **Metastasis**
  - Presence or absence of distant metastases

Stage I-IV
Tumor (Tis-T4)
Node (N0-N3)

- N0: no lymph nodes
- N1: 1-2 lymph nodes
- N2: 3-6 lymph nodes
- N3: 7+ lymph nodes
Metastasis (M0-M1)

- M0: no distant metastasis
- M1: distant metastasis (other organs, non-regional lymph nodes or peritoneal disease, including malignant ascites)
Stage I-IV

- **Stage I**
  - T1 or T2 N0

- **Stage II**
  - T1 or T2 N+
  - T3 or T4a N0

- **Stage III**
  - T3 or T4a N+

- **Stage IV**
  - T4b
  - M1
Staging evaluation

• Initial goal is to determine if patients have potentially resectable disease (stage I to III) or unresectable/metastatic disease (stage IV)

• **TNM**
  • First, we look for **M**
  • Then we evaluate **T** and **N**
CT of the chest, abdomen and pelvis

- Goal to evaluate for the presence or absence of distant metastases

- If there are suspicious findings, we biopsy the lesions to confirm distant metastases
- If there is ascites, we recommend sampling of the ascites to evaluate for the presence of cancer cells
- If there is no evidence of metastasis, PET/CT is performed to screen for distant metastases, as PET/CT is a more sensitive test in most cases
CT and PET/CT in a patient with metastatic gastric cancer

Stomach cancer

Lymph node in the upper chest
After negative CT and PET/CT

- we evaluate T and N
- Endoscopic ultrasound
Endoscopic Ultrasound (EUS)

- Goal to evaluate depth of invasion (T stage) and lymph node involvement (N stage)
- Biopsy of suspicious lymph nodes
- Repeat biopsy of primary tumor if additional tissue is needed
- If T2 or higher or N+, preoperative chemotherapy is the best treatment option
After endoscopic ultrasound

• we rule out metastatic disease that may not be visible on imaging studies (CT or PET/CT)

• Staging laparoscopy
Staging Laparoscopy

- Goal to directly visualize the liver surface, peritoneum, and local lymph nodes

- Biopsy of any suspicious lesions and peritoneal washings

- 20-30% of patients with no evidence of metastases on imaging have peritoneal metastases

- All patients with ≥ T1b disease are recommended to have staging laparoscopy

- Positive peritoneal cytology (even in the absence of visible peritoneal implants) is associated with poor prognosis and is considered metastatic disease
Staging Algorithm

CT chest/abdomen/pelvis

- Is there evidence of metastatic disease?
  - Yes: Biopsy to confirm metastatic disease
  - No: PET/CT

PET/CT

- Is there evidence of metastatic disease?
  - Yes: Biopsy to confirm metastatic disease
  - No: Endoscopic Ultrasound (EUS)

Endoscopic Ultrasound (EUS)

- T1a N0 tumor: No further testing
- ≥ T1b or N+ tumor: Laparoscopy
Molecular testing

- Microsatellite Instability (MSI) or Mismatch Repair (MMR) testing
  - Tumors with microsatellite instability (MSI) or mismatch repair deficiency (dMMR)
  - Tumors without microsatellite instability (MSS) or mismatch repair proficiency (pMMR)
- HER2 testing
  - 0 or 1+ → Negative
  - 2+ FISH- → Negative
  - 2+ FISH+ → Positive
  - 3+ → Positive
- PD-L1 testing
  - CPS (combined positive score) 0 → Negative
  - CPS ≥ 1 → Positive
Novel molecular tests

- Genomic profiling of the tumor (next-generation sequencing)
- Liquid biopsy (genomic profiling of circulating tumor DNA)
- EBV testing of the tumor
Conclusions

• Staging is the most important next step after diagnosis of gastric cancer
• Staging provides information about prognosis and guides treatment decisions
• Distinguishing between early stage disease (local or regional disease) and metastatic disease is the goal of the staging evaluation
• Once metastatic disease is ruled out, endoscopic ultrasound can help us decide if surgery should be the first step in therapy or if preoperative chemotherapy should be pursued first
  • In Western countries, the majority of gastric cancers are diagnosed at more advanced stages (stage II or above)
• Molecular testing (HER2, MSI, PD-L1) should be performed for all metastatic tumors but can also be considered in earlier stages