Introduction

Adenocarcinoma of the stomach is a tumor whose center is more than 2 cm below the esophagogastric junction. It must be distinguished from cancers of the cardia.

Even though its incidence is decreasing, in 2000 stomach cancer was the second digestive tract cancer in France, with 7000 new cases per year [1]. Prognosis is severe, since overall survival, a function of tumor stage [2], is 10%–15% at 5 years.


T:
  Tis: Intraepithelial tumor
  T1: Tumor limited to lamina propria or submucosa (superficial cancer)
  T2a: Tumor extended to muscularis propria
  T2b: Tumor invading subserosa
  T3: Tumor invading serosa
  T4: Tumor invading neighboring organs

N:
  N0: no lymph node invasion
  Nx: lymph nodes cannot be assessed or fewer than 15 lymph nodes examined
  N1: Metastasis in 1–6 regional lymph nodes
  N2: Metastasis in 7–15 regional lymph nodes
  N3: Metastasis in more than 15 regional lymph nodes

M:
  M0: No metastasis
  M1: Distant metastasis (retropancreatic, mesenteric, paraaortic, subclavicular lymph nodes)

Stages:

- Stage 0: Tis N0 M0
- Stage IA: T1N0M0
- Stage IB: T1N1M0
- Stage IIA: T2a/bN0M0
- Stage II: T1N2M0
- Stage IIB: T2a/bN1M0
- Stage IIIB: T3N0M0
- Stage IIIA: T2a/bN2M0
- Stage IIIB: T3N1M0
- Stage IIIC: T4N0M0
- Stage IV: T4 N1, 2, 3 M0
- T1, 2, 3 N3 M0

Pretherapy explorations

The incidence of gastric adenocarcinoma is high in the elderly. Initial tests should be adapted to the general health of the patient and to the possible therapies adapted to the patient's age.

Assessment of extension

Reference

- Esophagogastroduodenoscopy: indispensable for positive diagnosis, biopsies, and measuring tumor distances from the cardia and pylorus (expert agreement). Five to eight biopsies should be done on anomalies of the mucosal relief to reach the submucosa as much as possible. In the limitsplastica form, endoscopic biopsies have a sensitivity of only 50% [3].
- Thoracic-abdnominal-pelvic CT: useful for assessing resectability and searching for liver and lung metastases (level of evidence C). It can be useful for centering postoperative radiotherapy. Its performance in pinpointing the lymph node and parietal extension is less than echoendoscopy.
- Esophagogastroduodenoscopy transit: this test should not be systematic (expert agreement). Its diagnostic value disappears with echoendoscopy for diagnosing limitsplastica stomach cancer. However, several teams admit that it can be useful for high locations of gastric tumors and for centering postoperative radiotherapy.

Alternatives

- Echoendoscopy: the level of evidence for its use is only D for treatment of invasive tumors. On the other hand, it is useful when limitsplastica is suspected with hypertrophy of the gastric folds without positive histology (level of evidence C), to assess the extension of lesions in cases of limitsplastica (esophagus, pylorus), and to determine the stage of a tumor before neoadjuvant therapy.
- Abdominal ultrasound: it should not be systematic. It can help characterize the hepatic images discovered on CT (expert opinion). It can demonstrate direct signs (nodules) or indirect signs (minimal levels of peritoneal effusion) of carcinosis.
- MRI: it is not indicated in the local-regional extension assessment (level of evidence C) but can help in diagnosing noncharacteristic lesions in tomodensitometry.
- Exploratory laparoscopy: it can be useful with voluminous tumor with uncertain resectability on CT, to diagnose limited peritoneal carcinosis, or small peripheral hepatic metastases (level of evidence C). However, since there has been no formal proof of its utility, the literature does favor its systematic use.
- Positron emission tomography (PET): its place in gastric
Adenocarcinoma management is not defined and it should be discussed on a case by case basis.

- Tumor markers: no methodologically solid study has been conducted on the utility of the dosage of tumor markers. Their dosage is optional when they can be useful for evaluating a therapy option (expert opinion).

**Family predisposition**

- The onset of a gastric adenocarcinoma before the age of 40 years warrants oncogenetic consultation.
- Gastric adenocarcinoma belongs to the spectrum of HNPCC syndrome. It is also part of the familial adenomatous polyposis phenotype, Peutz-Jeghers syndrome and multiple juvenile polyposis.
- Certain familial forms of stomach cancers should be sought, within the oncogenetic consultation, such as a mutation of the E-cadherin gene. The hereditary diffuse gastric cancers are related to germlinal mutation of the antioncogene CDH1 with loss of the E-cadherin protein function. The diagnosis should be suggested when there are at least two cases of diffuse-type stomach cancers in first- or second-degree family members, with one case diagnosed before 50 years, or three cases in first- or second-degree relatives whatever their age [4]. The mode of transmission is autosomal dominant. With hereditary diffuse gastric cancers with confirmed mutation of the antioncogene CDH1, total prophylactic gastrectomy can be proposed from the age of 20 years in healthy carriers of the mutation [5]. If the surgery is refused, chromendo-oscopy should be proposed annually beginning at the age of 20 years. The high risk of associated breast cancer also warrants mammographic monitoring.
- In addition to the genetic syndromes described above, there are other cases of familial gastric carcinoma: gastroscopy with biopsies looking for Helicobacter pylori and the possible eradication in first-degree relatives.

**Preoperative workup**

**Operability workup**

- Consultation with an anesthesiologist is mandatory. Cardiological evaluation (ECG, echocardiography), pulmonary evaluation (lung function), and nutritional evaluation (percentage of weight loss, biochemical tests including proteinemia, albuminemia, orosomucoid, prealbuminemia, etc.) can be necessary depending on the patient’s condition.
- Complementary tests: if a cardiotoxic chemotherapy (epirubicin, 5FU) is planned, consultation in cardiology can be useful, depending on the patient’s condition and antecedents. A nonspecialized neurological examination is necessary before administering cisplatin (risk of neuropathy). The biochemical workup verifies the absence of contraindications to cisplatin (creatinine clearance) or irinotecan (bilirubinemia).

**Resectability criteria**

The resectability of a gastric tumor depends on its local extension (T stage) and distant metastasis. Although distant extension is a criterion for nonresectability (M1, N3), for the same T stage, the resectability of the tumor is variable.

- In theory, all T1, T2, and T3 stages are resectable. A stomach cancer invading the duodenum or the esophagus through continuity retains its T classification. Therefore a T2 or T3 cancer that crosses into the pylorus or the esophagocardiac junction can remain classified T2 or T3. Although the extension of the resection toward the esophagus is generally easy, duodenal resection often requires cephalic duodenopancreatectomy. This wide resection cannot be proposed to all patients (age, general health, associated lymph node invasion).
- Certain T4 cancers are resectable. Extension limited to the transverse colon, at the tail of the pancreas, the spleen, the left lobe of the liver does not present major problems for resection. More substantial retroperitoneal extension (aorta, renal pedicle, etc.) or toward the root of the mesenterium, invasion of the body and the head of the pancreas will make the tumor nonresectable.

**Treatments**

**Surgical resection**

Excisions via the laparoscopic approach can only be planned within prospective studies (expert agreement).

**Extension of the excision**

- For cancers of the pyloric antrum that are not the linitis plastica form, a 4/5 gastrectomy is sufficient [6, 7] (level of evidence A). The section line extends from the right border of the esophagogastric junction on the lesser curvature to the termination of the gastroepiploic arch on the greater curvature. The in situ macroscopic margin of safety should be at least 5 cm.
- For linitis plastica of the antrum, total gastrectomy is the reference treatment. The margin of duodenal excision should be 1 cm on the fresh resection specimen.
- For proximal cancers, total gastrectomy is preferable to upper pole gastrectomy (expert agreement).
- For cancers of the body of the stomach, total gastrectomy is the reference treatment.
- For lymph node removal accompanying treatment of cancers of the greater curvature suspected of being classified T3 or T4, splenectomy should be discussed (expert agreement).
- For cancers invading the neighboring organs, excision, if done, it should be monobloc with no dissection nor ruptu-re of the specimen.
- Palliative surgery of the stomach should only be envisaged, in multidisciplinary consultation for symptomatic tumors (dysphagia, bleeding, perforations) in patients in good general health (life expectancy greater than 6 months). Gastrectomy is preferable to deriva-tion any time it is technically possible. In other cases, endoscopic and/or medical treatments should be discussed.
- For locally advanced cancers, with macroscopically incomplete resection, the macroscopic residues should be clipped for possible postoperative irradiation.
- For cancers presenting liver metastases, resecting the metastases should be discussed on a case by case basis.

depending on the technical possibilities, the state of the lesions, and the patient's general health, and only if all the metastases are resectable. If the patient undergoes laparotomy (or in cases of diagnostic laparoscopy) pathological follow-up is indispensable for nonresectable metastases. Ovarian metastases should be resected if gastrectomy is done (expert opinion).

Re-establishing continuity: whatever type of gastrectomy is done, there is no standard for re-establishment of continuity. This choice is left to the surgeon.

A jejunostomy in patients who are undernourished or who may not tolerate adjuvant radiochemotherapy.

Extension of lymph node removal

Reference

a- Minimum removal should be D1 lymphadenectomy, i.e., including excision of perigastric lymph nodes. D2 lymphadenectomy includes excision of perigastric and pedicular lymph nodes with splenopancreatectomy for cancers of the body of the upper pole of the stomach. A minimum of 15 lymph nodes should be analyzed in D1 removal and 25 lymph nodes in D2 removal.

b- The therapeutic value of the extension of lymph node removal remains controversial. Prolonging survival by D2 lymph node removal compared to D1 removal, suggested by nonrandomized studies, has not been demonstrated [8-13], but a quality control in the major study showed that the theoretical level of removal was not respected in 84% of cases [14]. Depending on the study, N2 [12] or T3 [13] patients could benefit from a D2 removal, whose excess mortality and excess morbidity are related to the associated splenopancreatectomy. A reasonable and logical alternative (expert agreement) is to carry out D1 lymph node removal associated with pedicle removal (common hepatic, left gastric, and proximal splenic arteries) without splenopancreatectomy. Lower morbidity has been observed with this technique [15]. The splenopancreatectomy that completes the recommended standard lymph node removal is in fact a true D2 removal, and should only be discussed for cancers of the fundus (expert agreement). Invasive retroperitoneal adenopathy is classified as visceral metastases in the latest UICC classification and therefore does not legitimize splenopancreatectomy.

Pathology

Quality assurance of surgical excision

- Studies of the proximal, radial, and distal margins: the method used to measure the proximal and distal margins should be the same for a given center and specified in the workup report. The radial margins include the distance between the tumor and the nonperitoneal adipose tissue (gastroplenic, gastrohepatic, or gastrocolic ligament), they are at best measured microscopically after ink identification of the resection limit. Extemporaneous analysis of a surgical specimen requires samples from the entire gastric, duodenal, or esophageal circumference.

- Study of lymph node removal: a minimum of 15 lymph nodes should be analyzed in D1 lymph node removal and 25 lymph nodes in D2 removal [10].

The techniques of sentinel lymph node analysis and the search for micrometastases are not currently validated, which does not favor their systematic use or taking them into account in daily practice.

Pathological report

The pathological report should include at a minimum:

- Macroscopic data with the technique used to measure the specimen margins.
- Lauren histological classification and/or WHO classification. cf Table 1
- The existence or absence of lymphatic, vascular, or perineural emboli.
- Specific information on the extension to stomach walls and lymph nodes (number of lymph nodes invaded/number of lymph nodes analyzed) for T and N staging.
- Specific information on the tumor stroma, which should be described as fibrous, lymphoid, or inflammatory with granulocytes.
- Specific information on the resection margins to classify the excision as microscopically complete (R0) or microscopically incomplete (R1) or macroscopically incomplete (R2) using the surgical report.
- Data from the analysis of any biopsies from suspected metastatic sites for M staging.

Endoscopic treatments

- Endoscopic mucosectomy is an alternative treatment (expert agreement) for superficial cancers limited to the muscularis mucosae (T1). It requires echoendoscopic evaluation with miniprobe and a multidisciplinary consultation to assess the risk-benefit ratio of this technique compared to surgical excision.
- Palliative endoscopic treatments (stents, laser or Argon destruction) are possible for nonresectable forms (expert agreement).

Neoadjuvant and adjuvant treatments

1- Neoadjuvant chemotherapy of resectable forms is a possible alternative since the MAGIC study results [16]. The chemotherapy used was the association of epirubicine-cisplatin-SFU (ECF). The population studied presented

Table 1. – Histological classifications of gastric adenocarcinomas

<table>
<thead>
<tr>
<th>WHO Classification 2000</th>
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<tbody>
<tr>
<td>Histological type</td>
</tr>
<tr>
<td>Tubular adenocarcinoma</td>
</tr>
<tr>
<td>Papillary adenocarcinoma</td>
</tr>
<tr>
<td>Mucosal adenocarcinoma (mucinous colloid)</td>
</tr>
<tr>
<td>Independent-cell adenocarcinoma (signet ring cells)</td>
</tr>
<tr>
<td>Adenosquamous carcinoma</td>
</tr>
<tr>
<td>Epidermoid carcinoma</td>
</tr>
<tr>
<td>Small-cell carcinoma</td>
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<tr>
<td>Undifferentiated carcinoma</td>
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<td>Degree of differ netation</td>
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<tr>
<td>Highly differentiated</td>
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<tr>
<td>Somewhat differentiated</td>
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<tr>
<td>Poorly differentiated</td>
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<tr>
<td>Lauren classification</td>
</tr>
<tr>
<td>Intestinal</td>
</tr>
<tr>
<td>Diffuse</td>
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<td>Mixed ou unclassifiable</td>
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advanced-stage tumors, since 31% of the surgery alone group did not benefit from an R0 resection and 76% of the tumors were at least T3. The recurrence and overall survival rates were significantly higher in the chemotherapy arm. The interpretation of the MAGIC study is limited, until the final results are published, by the lack of data on surgical quality. A very low median survival rate of 19 months in the surgery-alone group suggests that a high number of patients had locally advanced disease and/or that lymph node removal did not correspond to what was recommended in the trial (D1).  
2 - Neoadjuvant chemotherapy of nonresectable, locally advanced forms has not been validated by the literature, but phase II studies in this area justify expert agreement to propose it.  
3 - Chemotherapies adjuvant to resection tested to date are not effective [17-19].  
4 - Intraoperative chemotherapy during surgery or immediately after has not been validated for resectable forms and should be studied further.  
5 - Pre-, intra-, and postoperative radiotherapy is not effective.  
6 - Immunotherapies adjuvant to resection that have been tested today have not been validated (level of evidence C).  
7 - Adjuvant radiochemotherapy has been shown to be effective in the MacDonald et al. phase III study [20] (level of evidence B). This investigation tested chemotherapy (FUFOL) within radiochemotherapy (FUFOL + 45 Gy) and demonstrated efficacy in terms of recurrence-free survival (48% vs 31%) and overall survival (50% vs 41%) at 3 years. Two-thirds of the patients were staged at T3 or T4 and 85% were N+. The main criticism on this trial concerned lymph node removal, which was D0 in 54% of the cases. The multivariate analysis performed secondarily on the population of the Hundahl et al. trial [21] found no interaction between the positive effect of the adjuvant treatment and the type of lymph node removal. However, the statistical power of this analysis was low because of the small number of D2 resections. These problems limit the applicability of adjuvant radiochemotherapy to resection for many experts, and it seems logical to choose between FOLFIRI, FOLFOX, and LV5FU2 (in elderly subjects with contraindications to other protocols).  

WHICH CHEMOTHERAPY IN METASTATIC CANCER AND FIRST-LINE TREATMENT  
The choice of chemotherapy depends on the patient (age, general health, conditions, etc.). The following protocols can be recommended: ECF, LV5FU2–cisplatin, FOLFIRI, FOLFOX or LV5FU2 (in elderly subjects with contraindications to other protocols).  

WHICH CHEMOTHERAPY IN METASTATIC CANCER AND SECOND-LINE TREATMENT  
There is no chemotherapy recognized as effective in terms of survival or quality of life in second-line treatment of gastric adenocarcinomas. It seems logical to choose between FOLFIRI, continuous 5FU–mitomycin C (or LV5FU2–mitomycin C) and 5FU–docetaxel in cases where 5FU–cisplatin or ECF combinations have failed. Epirubicin–docetaxel (EPITAX protocol) could be proposed after failure of 5FU–cisplatin. FOLFOX can be used when FOLFIRI fails and vice-versa.

Therapeutic indications

Palliative chemotherapies

Main protocols

- ECF, combining epirubicin, cisplatin, and continuous 5FU [25-27] remains the reference despite its difficult logistics (continuous perfusion of 5FU for 20 weeks). Response rates vary between 40% and 50%, but the benefit in terms of survival is low compared to FAMTX (9 vs 6 months) [25].  
- The combination of 5FU and cisplatin in its classic form over 5 days [28] or as a LV5FU2–cisplatin combination is widely used [29]. A comparative retrospective study (published as an abstract) seems to suggest that there is equivalent efficacy and better tolerance with LV5FU2–cisplatin compared to the conventional treatment [30].  
- ELF combining 5FU, folic acid, and etoposide [31] is an interesting protocol in patients presenting a contraindication to anthracyclines and cisplatin.  
- FOLFIRI, tested in the randomized, phase II FFCD 9803 trial (FOLFIRI vs LV5FU2–cisplatin vs LV5FU2) is better tolerated than LV5FU2–cisplatin; the results in terms of response rate, progression-free survival, and overall survival are in favor of FOLFIRI (level of evidence C) [32].  
- The combination of taxotere–cisplatin–5FU (DCF) was compared in a phase III study to 5FU–cisplatin. The results are in favor of the DCF arm for response rate, recurrence-free survival, and overall survival (10.2 months vs 8.5 months, p=0.006), at the price of higher hematological toxicity [33]. The docetaxel–continuous 5FU combination seems comparable to the ECF combination [34]. Docetaxel can be associated with epirubicin (Epitax protocol).  
- Even though no oral precursor of 5FU is approved for the market in Europe for treating gastric adenocarcinoma, their manageability has led certain teams to simplify the ECF combination by replacing continuous 5FU with an oral precursor [35, 36]. However, this has not yet been validated.  
- The combination of either continuous 5FU or its LV5FU2 form with mitomycin C can be a second-line treatment [37, 38].  
- FOLFOX seems to give response rates over 30% in phase II trials [39].

Reference

- Surgical resection (level of evidence A) and lymph node removal (level of evidence B) should be proposed following the modalities described in section IVA.  
- Postoperative radiochemotherapy should be proposed (level of evidence B).
• if lymph node removal is D0 and the tumor is greater than stage I.
• if lymph node invasion is N2 or N3, whatever the level of lymph node removal

Alternative
• For superficial T1 forms, mucosectomy can be discussed (expert agreement)
• ECF neoadjuvant chemotherapy is considered on a case by case basis (see section IV C1).
• The Mac Donald protocol chemotherapy [20] can be replaced by a LV5FU2 protocol (level of evidence D)
• For patients presenting N1 lymph node invasion with D1 or D2 lymph node removal, radiochemotherapy should be discussed on a case by case basis depending on the patient's general and nutritional health and his or her opinion after being clearly informed (expert agreement).

Trials
• FFCD projects: phase II trials of preoperative radiochemotherapy or postoperative radiochemotherapy with Folfiri. Coordinator: P Michel (activation planned for 2005)
• PETACC project: randomized phase II trial on preoperative radiochemotherapy or postoperative radiochemotherapy with 5FU, docetaxel, and oxaliplatin (activation planned for 2006), before a phase III trial with a reference arm of preoperative chemotherapy (MAGIC type). Coordinator: E van Cutsem.

Nonresectable forms with operable patient

LOCALLY ADVANCED, NONMETASTATIC TUMOR

Reference
Diagnosis of nonresectability either after a first laparotomy or after complete pretherapy workup or laparoscopy: first-line palliative chemotherapy (section IVD2) with second look in case of objective response(expert agreement).

Essai
Intergroup FFCD-GERCOR-FNCLCC-AERO 03-07 trial: ECC (epirubicin-cisplatin-capecitabine) then FOLFIRI versus FOLFIRI then ECC. Coordinator: R Guimbaud.

PERITONEAL CARCINOSIS

Reference
Palliative chemotherapy (section IVD2) (level of evidence B)

Alternative
Peritoneectomy with intraperitoneal chemohyperthermia (IPCH) is reserved for expert centers. This substantial procedure that has not yet been standardized is reserved for highly selected patients in good general health, whose carcinosis is macroscopically resectable [40, 41].

INCOMPLETELY RESECTED, NONMETASTATIC CANCERS (R1 OR R2)

Discuss radiotherapy or radiochemotherapy if the patient's general health allows it (WHO<3) based on clipped macroscopic residues or visible on postoperative CT or depending on the pathology report for microscopic residues (expert opinion).

Treatment of metastatic forms

RESECTED PRIMARY TUMOR

Reference
Palliative chemotherapy (level of evidence B) as soon as the patient's general health is WHO <3 to improve survival and quality of life. Use of first-line palliative chemotherapy (Section IVD2)

Alternative
Resection of liver metastases should be discussed on a case by case basis depending on the patient's general health and the data obtained on imaging, which should include thoracoabdominal spiral CT. It should only be proposed if radiological results provide hope for complete resection (expert opinion).

Trials
Intergroup FFCD-GERCOR-FNCLCC-AERO 0307 trial: ECC (epirubicin-cisplatin-capecitabine) then FOLFIRI versus FOLFIRI then ECC. Coordinator: R Guimbaud.

NONRESECTED, NONSYMPTOMATIC PRIMARY TUMOR

Reference
Palliative chemotherapy (Level of evidence B) (see Section IVD2)

Alternative
Resection of the primary tumor and metastases should be discussed on a case by case basis depending on the general health of the patient and the imaging data, which should include a thoracoabdominal spiral CT (expert opinion).

Trials
Intergroup FFCD-GERCOR-FNCLCC-AERO 03-07 trial: ECC (epirubicin-cisplatin-capecitabine) then FOLFIRI versus FOLFIRI then ECC. Coordinator: R Guimbaud.

SYMPTOMATIC NONRESECTED PRIMARY TUMOR

Reference
Same as previous section if nonresectable disease: discussion of palliative surgery for primary tumor with reference to gastrectomy rather than derivations, otherwise symptomatic treatment using radiotherapy or argon plasma for hemorrhages, stents for obstructions (expert agreement). Propose palliative chemotherapy if primary tumor symptoms are improved or allow it (level of evidence B).

PROGRESSION WITH CHEMOTHERAPY

Reference
No studies have been conducted to prove the utility of second-line chemotherapy.

Alternative
Propose second-line chemotherapy (Section IVD3) if the patient's general health allows (expert opinion).
NONOPERABLE PATIENT

Reference

Depending on the patient’s general health and the cardiological status, radiochemotherapy, palliative chemotherapy, or endoscopic palliative treatment (stent, argon plasma, etc.) can be proposed (expert agreement).

Alternative

Superficial forms (UST1NO) should benefit from mucosectomy (expert opinion).

GASTRIC LIMITIS PLASTICA

The diagnosis of limits plastica is macroscopic (whitish, thick, rigid stomach wall) with independent signet ring cells within a fibrous stroma on histology. Extension is often submucosal in the stomach wall, lymphophilic, and peritoneal, but rarely presents distant metastases. It must be distinguished from independent-cell adenocarcinomas that are not of the limitis plastica type.

Reference

• Surgery: gastrectomy should be total with extemporary analyses of the slices of the esophageal and duodenal sections (expert agreement).
• The indications for adjuvant radiochemotherapy are the same, for the same stage, as for other histologies.
• When the patient is not included in a trial, the metastatic forms should be treated preferably with ECF, which has been shown to be the most effective treatment for this histology.

Alternative

• Preoperative workup: echoendoscopy to specify the surface extension as well as extension toward the esophagus and the duodenum (expert opinion).

Trials

FFCD project, observation of a prospective cohort of patients who had palliative or standardized adjuvant treatment.

Monitoring

After curative surgery, in two large series [42, 43] the recurrence site after R0 resection was local-regional in 20% of cases, peritoneal in 34% of cases, distant in 26% of cases, and multiple in 20% of cases. In multivariate analysis, the two main risk factors are lymph node invasion and serosa involvement. The results reported in the literature do not warrant monitoring by tumor markers, but it should be noted that no study of sufficient statistical power has investigated the influence of this surveillance on survival. Few studies have been published on clinical, biochemical, and radiological monitoring of patients treated for stomach cancer. There have been no studies demonstrating the impact on survival of a monitoring protocol (non-randomized studies). On the other hand, no studies have shown the inefficacy of surveillance. Only patients who are assumed to be able to withstand effective treatment of recurrence (surgery, radiotherapy, and/or chemotherapy) should be monitored.

Posttherapy monitoring after curative treatment

Reference

No specific surveillance (expert agreement).

• If total gastrectomy: vitamin B12 1 mg IM/3–12 months +/- folates
• If splenectomy:
• Vaccinations: Pneumo 23 (if not done before surgery) with booster every 5 years, meningococcic A +C with booster every 3 years.
• Antibiotic prophylaxis with Oracillin (R) 1 tablet at 1 M IU morning and evening as long as possible and for at least 2 years. No antibiotic prophylaxis recommended for patients allergic to beta-lactamines. Conventional advice for splenectomy patients (antibiotic prophylaxis before dental treatment, rapid consultation in case of fever, splenectomy card, etc.)

Alternative (expert agreement):

• Clinical examination every 6 months for 5 years then once a month, including search for potential signs of recurrence and signs of undernutrition that could require consultation with a specialist.
• If splenectomy vaccination against Haemophilus influenzae (if not done before surgery) with booster every 3 years and against the flu every year.
• Biochemical workup: possibility of anemia after total gastrectomy warrants monitoring the white blood cell count once a year.
• Abdominal ultrasound every 6 months for 3 years then every year and a frontal chest x-ray every year for 3 years. These last two suggestions can be replaced by a thoracoabdominal spiral CT scan every 6 months for 3 years then clinical surveillance and abdominal ultrasound as described above.
• In cases of partial gastrectomy, endoscopic surveillance of the gastric stump is only logical after 10–15 years.
• Echoendoscopic surveillance of perianastomotic recurrence (after total gastrectomy) in highly selected patients at high risk of anastomotic recurrence (ex: margin invaded and treated by radiotherapy)

After palliative treatment

No recommendations for monitoring. Follow-up should be adapted to clinical signs.

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These recommendations are a synthesis of the literature and recommendations for good clinical practice from the organizations listed below:

REFERENCES


40. Gilly FN, Carry PY, Sayag AC, Brachet A, Panteix G, Salle B et al. Regional chemotherapy (with mitomycin C) and intra-operative hyperthermia for digestive cancers with peritoneal carcinomatosis. Hepatogastroenterology 1994;41:124-9