ASSISTED SURGERY FOR GASTRIC CANCER.

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Abstract: Gastric cancer is a malignant neoplasm that forms from the mucous epithelium and grows rapidly, spreading to other organs. The altered cells lose their original function, they only have the ability to divide uncontrollably, which leads to a rapid increase in tumor size.

Keywords: precancerous conditions and changes, gastric carcinogenesis, etiological factors, pylori in gastric.

Irregular nutrition, the predominance of animal fats and overcooked foods in food, eating too hot food, irritation of the mucous membrane with spicy seasonings, the harmful effects of nicotine and strong alcoholic beverages lead to the development of chronic inflammatory changes in the gastric mucosa, against the background of which focal proliferative processes may occur, and then - stomach cancer.Other environmental factors include industrial toxic substances (talc, asbestos, clay, paint, ceramics and metals). Helicobacter pylori (H. pylori) infection is of particular importance for the development of distal gastric cancer. Molecular biology has provided some evidence for the role of H. pylori in gastric carcinogenesis; H. pylori is considered a stimulator of cellular activity. Eradication of H. pylori provides a therapeutic effect in both gastric cancer and gastric non-Hodgkin lymphoma. Another infectious agent, the Epstein-Barr virus, is considered a cofactor in gastric carcinogenesis.It has now been clearly proven that cancer does not occur in a healthy mucous membrane. Numerous clinical observations and morphological studies of pathologically altered mucous membranes have allowed us to come closer to understanding pathological processes that may be precancerous. It is customary to distinguish between precancerous (or background) diseases and precancerous changes in the mucous membrane of the esophagus and stomach.The first are pathological conditions that, under appropriate conditions, can lead to the development of cancer (gastroesophageal reflux disease, Barrett's esophagus, chronic gastritis, ulcers, gastric polyps, operated stomach), i.e. are associated with

an increased risk of cancer. The second are morphologically proven changes in the mucous membrane, reliably indicating the development of a process that stimulates malignant growth.

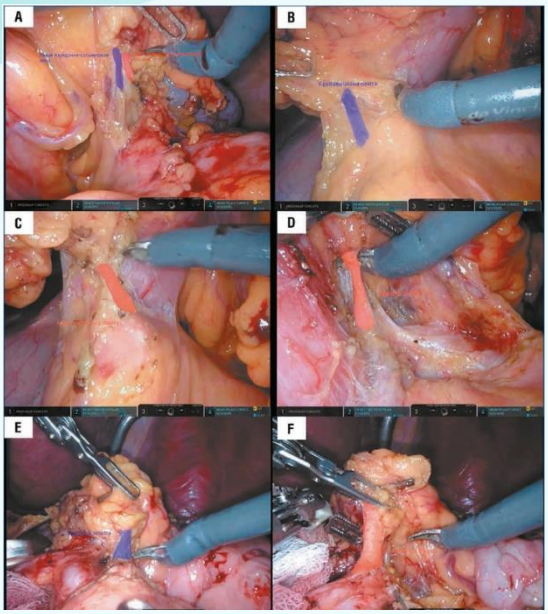
Surgery for gastric cancer remains one of the most technically challenging areas in abdominal oncology. The frequency of both intra- and postoperative complications is quite high, despite modern advances in anesthesiology and the level of technical support. Robot-assisted surgical interventions make it possible to demonstrate all the benefits of minimally invasive technologies for the patient. Additional safety is provided by one surgeon controlling the operation of the video system and robotic instruments. The technical features of the robotic complex can be implemented to improve the quality of surgical intervention, reduce the incidence of intra- and postoperative complications, improve the quality of lymphadenectomy and improve oncological results. The article presents a description of our own method of performing surgical interventions for gastric cancer using a robotic surgical complex. Unlike foreign colleagues who use up to seven robotic instruments, the process of performing gastrectomy and distal subtotal gastrectomy using four robotic instruments has been developed and optimized, which allows for maximum standardization of the technique and reduction of financial costs. The method of using indocyanine green with the possibility of visualizing in the infrared spectrum its accumulation in lymph nodes, which are routes of lymphogenous metastasis, is described separately, which can improve the accuracy of staging and determine prognosis.

The development of minimally invasive surgical technologies in general could not but influence changes in the approach to surgical treatment of such a complex pathology as gastric cancer. The desire to reduce the morbidity of surgical intervention while maintaining the overall quality of the operation and comparable oncological results has led to the introduction of minimally invasive laparoscopic and robot-assisted technologies in the field of surgical treatment of gastric cancer assisted operations, in turn, are attractive for their technical advantages, which can be realized in improving the quality of surgical intervention, reducing the incidence of intra- and postoperative complications, improving the quality of lymphadenectomy and improving oncological results. The general advantages of minimally invasive surgery are known, such as less trauma to the tissues of the abdominal cavity and anterior abdominal wall, as a result of which the risks of developing adhesions are reduced, the degree of systemic inflammatory reaction is reduced, and a more pronounced cosmetic effect is formed. In the early postoperative

period, the intensity of the pain syndrome is much less than after open interventions. This promotes early activation and rehabilitation, earlier initiation of oral nutrition, reducing the risk of thromboembolic complications, avoiding the use of narcotic analgesics, and reducing the length of hospital stay. In addition to the general advantages of minimally invasive surgery, which can be realized using traditional laparoscopic techniques, it is necessary to note the significant technical features of the robotic surgical complex, attractive from the point of view of precision and safety.

When performing surgical interventions for gastric cancer, we used the following arrangement of trocars and connections of manipulators. When working on da Vinci Si in the left, right hypochondrium and in the right mesogastric region along the midclavicular line - one working trocar with a diameter of 8 mm with further connection of robotic manipulators No. 1, 2, 3, respectively, in the umbilical zone - a trocar with a diameter of 12 mm to install a video system, in the left mesogastric region along the midclavicular line - an assistant trocar with a diameter of 12 mm. When planning a total gastrectomy in the right mesogastric region along the midclavicular line, a trocar with a diameter of 12 mm was installed with an additionally installed 8 mm working trocar for the purpose of further use of a linear stapler. A Nathanson retractor was installed through a 5 mm incision in the subxiphoid region to retract the left lobe of the liver.

The fourth generation da Vinci Xi complex has a number of technical features and objective advantages compared to the previous generation Si system. The patient console (trolley) has improved ergonomics with high mobility of robotic manipulators, vertical access to the patient with the possibility of additional 360° rotation of the block, which provides multi-quadrate anatomical access from four sectors with the possibility of single docking. The touch panel of the patient console with additional software allows you to optimize docking for a specific surgical area and connect the console on any side of the patient. When using the Si system when performing surgery for gastric cancer, docking is possible only from the side of the patient's head. Laser targeting helps in placing trocars and establishing the optimal position of manipulators, and the additional patient clearance function allows you to avoid conflict of instruments and expand the range of work in the surgical field. Significant distinctive features can be noted in the camera and endoscope. The endoscope is longer and has a universal diameter of 8 mm, which allows it to be installed in any of the four trocars. The camera is significantly smaller and lighter with automatic 3D image calibration, autofocus, white balance and a built-in fire fly laser fluorescence imaging system. The ERBE Vio dV surgical power generator is integrated into the video stand and has software that allows settings to be made on the surgeon's console.



Clinical classification of gastric cancer:

• Stage I - a small, clearly demarcated tumor located in the thickness of the mucous membrane and submucosal layer of the stomach; no metastases;

• Stage II - a tumor growing into the muscular layers of the stomach, but not growing into its serous layer; the stomach remains mobile; in the nearest regions of the lymph nodes - single metastases;

• Stage III - a significant tumor that extends beyond the stomach wall, adheres to neighboring organs and grows into them; the mobility of the stomach is severely limited;

• Stage IV - a tumor of any size and any nature in the presence of distant metastases.

International TNM classification of gastric cancer (4th edition)

T - primary tumor.

• Tx - insufficient data to evaluate the primary tumor.

• T0 - the primary tumor is not detected.

• Tis (carcinoma in situ) - preinvasive carcinoma: intraepithelial tumor without invasion of the lamina propria.

• T1 - the tumor infiltrates the gastric wall to the submucosal layer.

• T2 - the tumor infiltrates the gastric wall to the subserosal membrane.

• T3 - the tumor invades the serosa (visceral peritoneum) without invasion of adjacent structures.

• T4 - the tumor has spread to adjacent structures.

N - regional lymph nodes.

• Yx - there is not enough data to evaluate regional lymph nodes.

• No - there are no signs of metastatic damage to regional lymph nodes.

• N1 - there are metastases in the perigastric lymph nodes no further than 3 cm from the edge of the primary tumor.

• N2 - there are metastases in the perigastric lymph nodes at a distance of more than 3 cm from the edge of the primary tumor or in the lymph nodes located along the left gastric, common hepatic, splenic or celiac arteries.

M - distant metastases.

• Mx - insufficient data to determine distant metastases.

• M0 - no signs of distant metastases.

• M1 - there are distant metastases.

Although there are no symptoms specific to stomach cancer, there are signs that indicate its possibility. Precancerous diseases - atrophic gastritis, chronic gastric ulcers, polyps.Dyspeptic symptoms are the most common symptom. Loss of appetite to the point of complete aversion to food in people over 40-50 years of age, mild nausea, heaviness in the epigastric region, and it all ends in anorexia. The sometimes observed increased appetite, combined with the patient's gradual weight loss, is a consequence of insufficient absorption of food and frequent diarrhea.

Rapid satiety is a fairly common symptom of stomach cancer. It indicates a decrease in stomach capacity. Characteristic is an unmotivated aversion to food, especially meat. This symptom occurs in the later stages of the disease and is persistent and increasing in nature.“Gastric discomfort” - fullness, pressure, slight burning, mild cramping pain after a heavy meal and other eating disorders. The patient gradually limits himself to food, a feeling of heaviness progressively increases, which does not decrease or disappear.

Belching rarely bothers patients with stomach cancer. Gradual intensification, a change in its character (transformation of belching with air into “rotten”) indicates an organic lesion.

Drooling is more typical for cancer of the esophagus, but also occurs with cancer of the stomach, especially its cardiac section.

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