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<sup>1,2</sup>ZH.ZH. Zholdybay, <sup>1</sup>D.M. Zhetpisova, <sup>1</sup>A.Y.Kozhabekova, <sup>1</sup>G.S. Akhmetova, <sup>1,2</sup>Zh.K.Zhakenova<sup>1</sup>Kazakh Institute of Oncology and Radiology<sup>2</sup>Asfendiyarov Kazakh National Medical University

## Capabilities of computer tomography in gastric cancer diagnostics

Early diagnostics of gastric cancer (GC) remains a vital problem of today. This study was done to define the relevance and potential of computer tomography (CT) in diagnostics of GC. The study group consisted of 59 patients at the mean age of 59.8 with primary diagnosed GC. They underwent CT before surgery to determine the prevalence of the process. The CT results were analyzed by the process localization, tumor growth form, visualization of regional lymph nodes, CT-semiology of GC, invasion of the adjacent organs, and the presence of distant metastases. The CT showed the prevalence of endophytic GC growth form (46 cases, 78%) over the mixed (11, 19%) and exophytic forms (2, 3%). In most cases, GC was observed in the stomach body (49%). The augmentation of regional lymph nodes was revealed in 47.4% of GC cases. The adjacent organs were invaded in 5 (8.5%) cases, with liver metastases in 2 (3.4%) cases. In 11.9% of cases, CT allowed to review the stage of the process and treatment strategy.

CT is the method of choice for the staging of gastric cancer.

**Keywords:** computer tomography, gastric cancer.

**Relevance.** Gastric cancer (GC) ranks five in the world among other cancers. 951,000 new cases of GC were registered in 2012 accounting for 7% of all malignances. GC is the third cause of cancer mortality worldwide after lung and liver cancers [1, 2]. In 2014, GC ranked fourth in Kazakhstan among all cancers and second in the structure of cancer mortality [3]. GC has a high recurrent rate and a low five-year survival index worldwide (about 25-30% in 2012), as well as in Kazakhstan (46% in 2014).

Early diagnostics of GC remains a vital problem of today. The main diagnostic technique is esophagogastrosocopy followed by biopsy [5]. The radiological methods of GC diagnostics include X-ray imaging, stomach CT or MRI [6]. Standard 2D-mode CT programs provide only 20-56% sensibility of CT in GC diagnostics therefore today CT is not used for primary radiological diagnostics of GC but is the method of choice mainly for the staging of GC [5].

The presented study was done to define the potential of CT in diagnosing the GC.

**Material and methods.** 122 patients with histologically verified malignant neoplasm of stomach underwent stomach CT in Kazakh Institute of Oncology and Radiology from Jan. 01, 2015 till Nov. 01, 2016. Of them, 63 (51.6%) patients with previously established GC passed CT repeatedly so they were not included in the research.

The study group consisted of 59 patients at the mean age of 59.8 with primary diagnosed GC. All patients previously underwent esophagogastrosocopy followed by biopsy and were diagnosed with GC. They underwent CT before surgery to determine the prevalence of the process. The CT results were analyzed by the process localization, tumor growth form, visualization of regional lymph nodes, CT-semiology of GC, invasion of the adjacent organs, and the presence of distant metastases.

The examination was done using the computer tomographic scanner LightSpeedVCT (GE) with oral and intravenous administration of a contrast agent (visipack, ultrawhist). The CT research was conducted in the axial plane with the subsequent re-formatting in the sagittal and frontal planes.

**Results.** The CT results were analyzed by the process localization, tumor growth form, and visualization of regional lymph nodes. Figure 1 provides the distribution of GC cases by growth form according to CT.

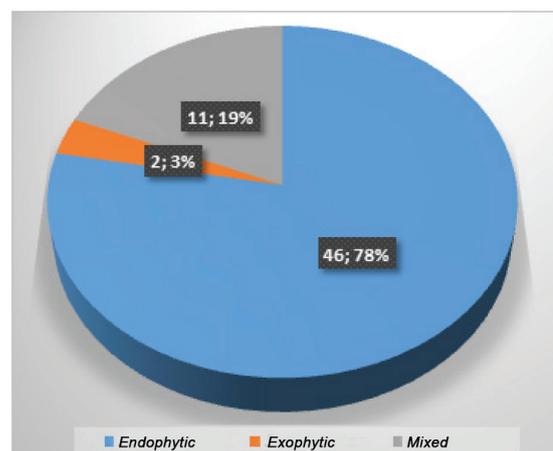


Figure 1 - Distribution of GC cases by growth form according to CT

As shown in Fig. 1, endophytic growth form (46 cases, 78%) prevailed over the mixed (11, 19%) and exophytic forms (2, 3%).

Figure 2 shows the distribution of GC cases by localization of the process according to stomach CT.

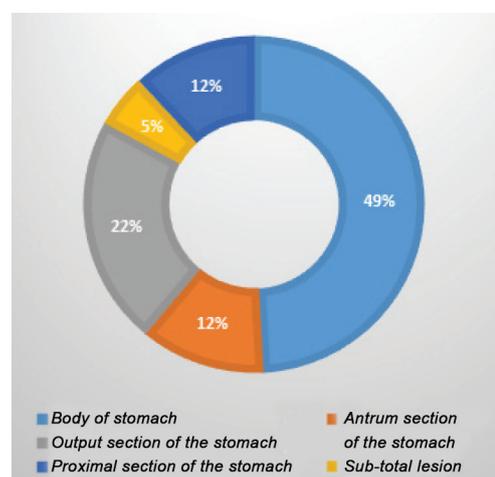
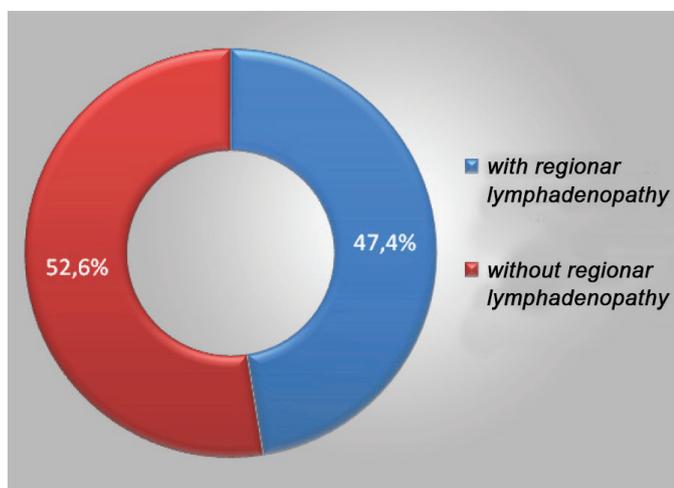


Figure 2 - Distribution of GC cases by process localization according to CT

In most cases, GC was localized in the stomach body (49%). Localization in the pylorus was 2.2 times less often (22%), even more rarely - in proximal section (12% cases), with the least number of cases in antral section (5%). Subtotal lesion of stomach was observed in 12% of cases.

Figure 3 provides the results of analyses of enlarged regional lymph nodes in GC patients on CT-slices.



**Figure 3** – Involvement of regional lymph nodes during GC according to CT

The CT of stomach and abdominal organs showed the augmentation of regional lymph nodes in 47.4% (28) of GC cases. In 52.6% of cases, the lymph nodes were not visualized.

CT semiology of GC was studied to analyze the frequency of the following symptoms on CT-slices of GC patients: the thickening of the stomach wall, the pathological reorganization of relief, the unevenness and blurring of stomach contours. All 59 (100%) patients had thickened stomach walls, the unevenness and blurring of stomach contours was observed in 41 (69.5%) cases while the

pathological reorganization of relief was rare on CT-slices and was found only in 9 (15.3%) cases. The maximum thickness of stomach wall at GC reached 3.2 cm according to CT.

The stomach CT allowed analyzing invasion of gastric tumor process in adjacent organs and the presence of metastatic process in the abdominal organs, retroperitoneal space and bone structures. The adjacent organs were invaded in 5 (8.5%) cases, with liver metastases in 2 (3.4%) cases.

Conclusion. In 11.9% of cases, CT allowed to review the stage of the process and treatment strategy. CT is the method of choice for the staging of gastric cancer.

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