

CT EVALUATION OF GASTRIC LYMPHOMA

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Abstract: The purpose of our study was to determine the value of computed tomography (CT) with a drug-induced hypotonia and water filling in the diagnosis and preoperative staging of 27 patients with gastric lymphoma (GLy) confirmed by endoscopic biopsy.

CT scans were performed in a supine and prone position with drug-induced hypotonia and water-filling of stomach with 500–700 ml., and intravenous administration of a non-ionic contrast agent. The prone position and drug-induced hypotonia allowed visualization of the whole gastric wall and prevented gas artifacts, commonly present during supine imaging.

CT scans were analysed with respect to the thickness of the stomach wall, rugal thickening, presence of wall infiltration, mucosal nodularity, ulcerations and tumour masses, regional tumour spread, lymph node deposits and presence of distant metastases. The most common findings in GLy were ulcers of variable size, depth and number in 43% of cases, a mass with or without an ulcer in 36% of cases, and rugal thickening in 21% of cases. According to CT results, GLy was staged in four groups: I, II1, II2, III and IV. Precise preoperative staging was achieved in 73%, overstaging in 18% and understaging in 9% of patients. The sensitivity and specificity of the technique was 93% and 85% respectively. There was low grade MALT lymphoma in 69% and high grade MALT lymphoma in 31% of cases.

We believe that CT performed using this method is a useful non-invasive method for preoperative evaluation and staging of gastric lymphoma and should be used before surgery is planned.

Key words: CT, gastric lymphoma, MALT lymphoma, staging.

Introduction

Primary lymphomas of the gastrointestinal tract usually involve only one site. Dawson *et al.* [1] cited five criteria that must be met for the diagnosis of a primary gastrointestinal lymphoma to be made:

1. No palpable superficial lymph nodes are seen.
2. Chest radiographic findings are normal (i.e., no adenopathy).
3. The white blood cell count (both total and differential) is normal.
4. At laparotomy, the alimentary lesion is predominantly involved, with lymph node involvement (if any) confined to the drainage area of the involved segment of gut.
5. There is no involvement of the liver and spleen.

Primary gastrointestinal lymphoma is the most common extra-nodal manifestation of non-Hodgkin lymphoma, accounting for up to 20% of all cases [2, 3].

The stomach is the most common primary site of extra nodal lymphoma. Primary gastric lymphoma is uncommon, constitutes only 2%–5% of malignant gastric lesions, and is the most common type of extranodal lymphoma, accounting for 50%–70% of all primary gastrointestinal lymphomas [4]. However, there is normally no lymphoid tissue in the gastric mucosa, and this paradox can be explained by the fact that chronic *Helicobacter pylori* gastritis is associated with the development of lymphoid tissue in the lamina propria [15]. Most low-grade primary gastric lymphomas arise from this mucosa-associated lymphoid tissue (MALT) and are therefore classified as MALT lymphomas [16]. As a result, it has been postulated that chronic infection of the stomach by *Helicobacter pylori* causes lymphoid proliferation in the gastric mucosa, with subsequent development of gastric MALT lymphoma [17].

At histological analysis, gastric MALT lymphoma can be classified into two types: low grade and high grade [18]. Low-grade MALT lymphoma diagnosed at an early stage has a good prognosis [5, 19].

The classification and staging of primary gastrointestinal lymphomas is best made with the classification system adopted at the Consensus Conference in Lugano in 1993 [6]:

- stage I – tumour confined to gastrointestinal tract, single primary site, and multiple noncontiguous lesions;
- stage II – tumour extends into the abdominal cavity from the primary gastrointestinal site (II1, local nodal involvement; II2, distant nodal involvement);
- stage III – penetration through serosa to involve adjacent organs or tissues; and

- stage IV – disseminated extranodal involvement or a gastrointestinal tract lesion with supradiaphragmatic nodal involvement.

Most patients present with stage II disease.

The most commonly used imaging modalities are a barium examination and computed tomography (CT). These modalities are complementary, although CT provides a better overall assessment of the disease stage.

Computed tomography (CT) is indispensable for evaluation of higher-stage tumors and extragastric involvement. However, CT is of limited value in diagnosing low-grade MALT lymphoma featuring minimal gastric wall thickening or a shallow lesion [20].

As a result, double-contrast upper gastrointestinal (UGI) examination is the most effective tool for detecting lesions at the earliest and curable stage. The appearance of gastric MALT lymphoma at UGI examination was first reported as innumerable tiny nodules throughout the stomach [17]. Later, several studies demonstrated mucosal nodularity, a shallow or deep ulcer, single or multiple masses, rugal thickening, and enlarged areae gastricae [8, 21].

The purpose of our study was to determine the value of computed tomography (CT) with a drug-induced hypotonia and water filling in the diagnosis and preoperative staging of 27 patients with gastric lymphoma (GLy) confirmed by endoscopic biopsy.

Material and Methods

We reviewed 27 patients, 10 women and 17 men, age range between 34–75 years, mean age 58 years, (Table 1) with GLy histopathologically proved at endoscopic biopsy. The presence of *Helicobacter pylori* infection was histopathologically confirmed in 23 patients, and the remaining 4 patients had a history of treatment for gastritis or peptic ulcers.

Table 1 – Табела 1

Patient distribution in decay according to gender and age
Дистрибуција на пациенти по декаде според пола и возрасћа

GENDER	AGE					TOTAL
	< 40	41–50	51–60	61–70	> 70	
Male	1	2	6	5	3	17
Female		2	4	3	1	10
Total	1	4	10	8	4	27

All patients underwent double-contrast upper GI examinations and computed tomography (CT) for the analysis and staging of the lesions. CT scans were performed in supine and prone positions with drug-induced hypotonia and water-filling of stomach with 500–700 ml, and intravenous administration of a non-ionic contrast agent. The prone position and drug-induced hypotonia allowed visualization of the whole gastric wall and prevented gas artifacts, commonly present during supine imaging.

The radiologic signs evaluated were the presence of an ulcer, mass formation, mucosal nodularity, and rugal thickening. The extent of the lesions was categorized as being in the antrum, body, or fundus.

The depth of invasion, presence of ulcer, mass formation, rugal thickening, and involvement of lymph nodes were also determined at CT examination, and we performed a CT staging of the disease. We then correlated the findings of double-contrast upper GI examinations and CT examinations with those of pathologic examinations.

Results

The clinical symptoms were epigastric pain or discomfort in 22 patients, anorexia in 2, no symptoms in 2, and GI bleeding in 1.5 patients had anaemia at laboratory examination.

All 27 patients with GLy showed abnormal findings at upper GI examination. Of these patients, 9 had lesions in the antrum, 7 had lesions in the body, 8 had lesions in the antrum and body, 1 had lesions in the fundus, and 2 had lesions in the body and fundus. Biopsy specimens demonstrated low-grade MALT lymphoma in 19 patients (70%) and high-grade MALT lymphoma in 8 patients (30%). The high-grade MALT lymphomas included a background of low-grade MALT lymphoma at pathologic examination. (Table 2)

Table 2 – Табела 2

Patient distribution according to Consensus Conference in Lugano 1993
Дистрибуција на пациенти према Консензус Конференци
во Лугано 1993

Low-Grade Lymphoma	19 (70%)
High-Grade Lymphoma	8 (30%)

Double-contrast studies may reveal ulcerative, polypoid, or infiltrative patterns. The diagnosis of lymphoma may be suggested by the presence of multiple polypoid tumours, (Fig. 1b) especially with central ulceration ("bull's

eye" appearance), giant cavitating lesions, or extensive infiltration with gastric fold thickening. (Fig. 1a) The latter finding may be distinguished from linitis plastica on the basis of the preservation of gastric distensibility.

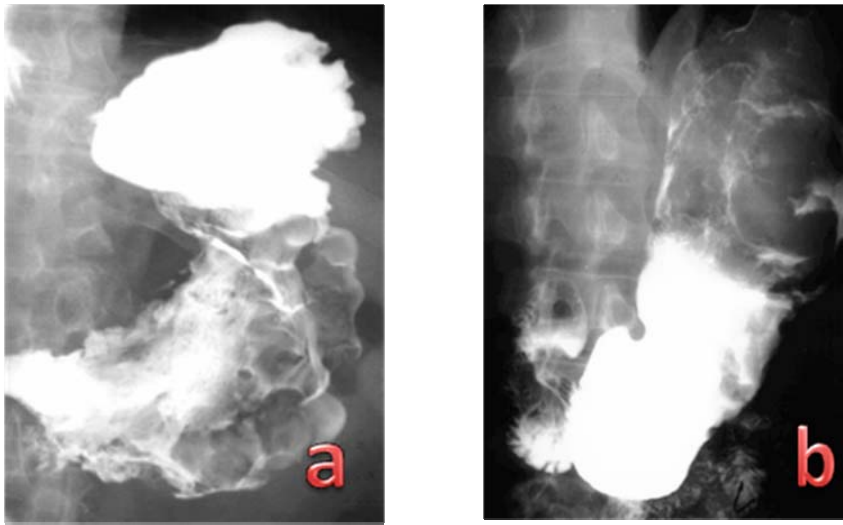


Figure 1 – High-grade gastric MALT lymphoma: a) Radiography shows diffuse, homogeneous thickened folds with a mass and lobulated inner surface of a gastric wall in the corpus and antrum of the stomach, b) Radiography shows a mass with nodular margins in the fornix and corpus of the stomach

Слика 1 – Високостепенной MALT лимфом на желудник: а) Радиограмой и прикажува дифузно, хомогено задебелување на набориите со маса и лобулирана внатрешна површина на сидой на желудничкой во предел на корпусой и антрумой, б) Радиограмой и прикажува маса со нодуларни рабови во предел на форниксой и корпусой на желудничкой

CT scans were analyzed with respect to the thickness of the stomach wall, rugal thickening, presence of wall infiltration, mucosal nodularity, ulcerations and tumor masses, regional tumor spread, lymph node deposits and presence of distant metastases.

The most common CT findings in GLy were ulcers of variable size, (Fig. 2) depth and number in 12 (43%) cases, a mass with or without an ulcer in 10 (36%) cases, and extensive infiltration with gastric fold thickening in 5 (21%) cases. (Fig. 3) (Table 3)

Single or multiple ulcers were found in 12 patients (43%), and were the most common finding, especially in low-grade MALT lymphoma. (Fig. 4) The ulcers were of varying size and were shallow or deep. Single or multiple masses were seen in 10 patients (36%).



Figure 2 – Low-grade gastric MALT lymphoma. Axial contrast-enhanced CT scan obtained through the stomach shows segmental and mild wall thickening of the body, with deep ulcer. Note MS deposit in perigastric lymph node

Слика 2 – Нискокостепености MALT лимфом на желудник. Аксијален контрастиран CT скен низ желудничкиот, покажува сегментално и умерено задебелување на ѕидот на желудничкиот во предел на корпусот со длабок улкус. Се забележуваат МС депозити во перигастричните лимфни јазли



Figure 3 – High-grade MALT lymphoma of the stomach: Axial contrast-enhanced CT scan obtained through the stomach shows diffuse thickening of entire gastric wall in region of corpus and fornix. Note that inner contour of gastric wall is diffusely irregular

Слика 3 – Вискокостепености MALT лимфом на желудник: Аксијален контрастиран CT скен низ желудничкиот, покажува дифузно задебелување на целиот ѕид на желудничкиот во предел на корпусот и форниксот.

Се забележува дифузна ирегуларност на внатрешната контура на ѕидот на желудничкиот

Table 3 – Табела 3

Radiology findings in low and high grade lymphomas
Радиолошки наоди кај ниско и високостепените лимфоми

Rtg. finding	Total Cases	Low-Grade Ly.	High-Grade Ly.
Ulcer (shallow or deep)	12	8	4
Mass with or without ulcer	10	4	6
Infiltration with fold thickening	5	4	1

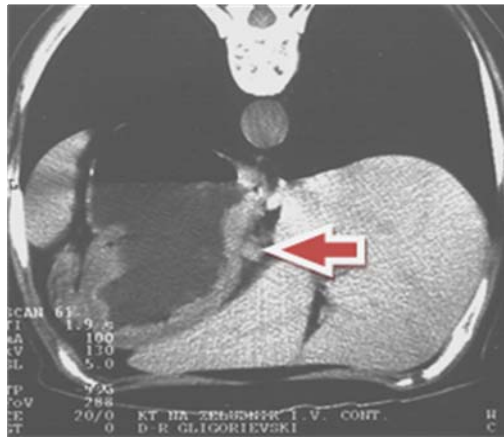


Figure 4 – Low-grade MALT lymphoma of the stomach: Axial contrast-enhanced CT scan obtained through the stomach shows segmental and mild wall thickening of the body of the stomach, with minimal contrast enhancement. MS deposit in the perigastric lymph node

Слика 4 – Нискостепенитој MALT лимфом на желудник. Аксијален постој контрастиран CT скен низ желудничкој, покажува сегментално и умерено задебелување на ѕидот на желудничкој во предел на корпусот, со минимално контрастино престојување. Се забележува МС депозиции во перигастричен лимфен јазол

A mass with or without an ulcer was the second most common finding, along with thickened folds. In cases of high-grade MALT lymphoma, a mass was the most common finding. (Fig. 5) The diameter of the masses was larger in cases of high-grade lymphoma (5–10 cm) than in cases of low-grade lymphoma (1–5 cm).

Six patients had multiple masses, whereas four patients had a single mass. Most of the patients with a single or with multiple masses had an accompanying ulcer in the mass. Some of the patients had mucosal convergence around the mass.

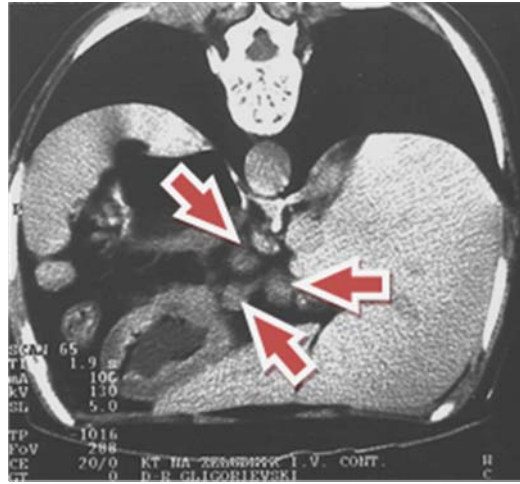


Figure 5 – High-grade MALT lymphoma of the stomach: Axial contrast-enhanced CT scan obtained through the stomach shows diffuse wall thickening of the body, with minimal contrast enhancement. MS deposits in lymph nodes
Слика 5 – Високостепенној MALT лимфом на желудник: Аксијален њосћ конћрасћ CT скен низ желудничој, њокажува дифузно задебелување на сидој на желудничој во ѡредел на корћусој, со минимално конћрасћно ѡребојување. Се забележуваај MS дејозии во лимфниће јазли

Rugal thickening was found in 10 patients (36%) of cases. Thickened folds were an accompanying finding (converged) to other lesions, such as masses, ulcers, or mucosal nodularity, rather than a unique finding. (Fig. 4) (Fig. 5)

Precise preoperative staging was achieved in 73%, overstaging in 18% and understaging in 9% of patients. The sensitivity and specificity of the technique was 93% and 85% respectively. There was low grade MALT lymphoma in 70% and high grade MALT lymphoma in 30% of cases.

According to the classification system adopted at the Consensus Conference in Lugano in 1993 and CT results, GLy was staged in five groups: I, II, II2, III and IV. (Table 4)

Table 4 – Табела 4

Patient distribution in stadiums according to Consensus Conference – Lugano 1993
Дисћрибуција на ѡациенћиће со сћадуми сћоред
Consensus Conference во Лугано 1993

Group	I	II	III	IV	V
Stadium	I	II1	II2	III	IV
Total	3	12	8	3	1

Barium studies may demonstrate subtle lesions not seen at CT but do not demonstrate the true extraluminal extent of the disease and are of little value in staging. In addition, the stomach remains pliable even with extensive lymphomatous infiltration, and the lumen is preserved, making gastric outlet obstruction a rather uncommon feature.

At CT, gastric wall thickening has been noted to be much less severe in low-grade lymphoma than in high-grade lymphoma, and abdominal lymphadenopathy is less common in low-grade lymphoma.

Perigastric adenopathy was found in 12 patients, and in 8 patients bulky lymph nodes were found, extending below the renal, which is highly predictable for MS deposits. In one patient MS deposits in the liver were found.

Discussion

Gastric MALT lymphoma showed variable radiologic features at UGI examination. In particular, low-grade MALT lymphoma had a wider spectrum of appearances than high-grade MALT lymphoma [5, 14].

A variety of findings have been described in both low- and high-grade MALT lymphomas at upper gastrointestinal examination, including single or multiple ulcers of varying size; single or multiple masses with or without an ulcer, along with thickened folds; submucosal masses, centrally ulcerated (bull's-eye) lesions; polypoid lesions; rugal thickening, commonly converging to an ulcer or a mass; mucosal nodularity of varying size, either focal or diffuse; and coarse *areae gastricae* [8, 17].

Low-grade MALT lymphoma has a wider spectrum of appearances than does high-grade MALT lymphoma, in which a mass-forming lesion or severe fold thickening is present in most cases [5, 7, 9].

It has also been postulated that the absence of abnormality at CT is highly predictive of low-grade MALT lymphoma [10], and greater than minimal thickening should be considered as possibly indicating transformation to a higher grade [7, 11].

Preservation of the perigastric fat planes at CT is more likely to be seen in lymphoma than in adenocarcinoma, particularly in the presence of a bulky tumour [5, 7, 12]. However, non-Hodgkin gastric lymphoma should be recognized as another cause of linitis plastica, an appearance that results from dense infiltrates of lymphomatous tissue in the gastric wall without associated fibrosis [13].

Adenopathy is seen with both adenocarcinoma and lymphoma, but if it extends below the renal hila, or the lymph nodes are bulky, lymphoma is more likely [11, 12].

The most common finding in low-grade MALT lymphoma was an ulcer (50% of cases), which was the second most common finding in the report by Kim *et al.* [21].

The most common finding in high-grade MALT lymphoma was a mass, which was present in most cases (67%).

Multiple shallow lesions tended to occur in low-grade rather than high-grade MALT lymphoma. A mass with or without an ulcer was the second most common finding in gastric MALT lymphoma (36% of cases). A mass was the most common finding in cases of high-grade MALT lymphoma (67%), and masses were seen in only 27% of patients with low-grade MALT lymphoma. The masses were larger in high-grade than in low-grade MALT lymphoma. Masses in gastric MALT lymphoma were accompanied by an internal ulcer in 70% of cases.

The study by Kim *et al.* [21] revealed thickened mucosal folds converging on the ulcer in 75% of patients, and a mass in 16% of patients, with low-grade MALT lymphoma. It was difficult to differentiate gastric MALT lymphoma manifesting as an ulcer from other stomach diseases, especially gastric adenocarcinoma.

Rugal thickening was the second most common finding, along with masses. Rugal thickening was an accompanying finding to other lesions, such as ulcers or masses, rather than a unique finding. [7, 8, 21]

The paradox of lymphoma arising in the stomach has been explained by the observation of MALT in the stomach in response to infection with *H pylori* and by the presence of this organism in more than 90% of gastric MALT lymphomas [15]. In addition, MALT lymphomas with associated *H pylori* gastritis tended to manifest as multiple lesions more often than MALT lymphomas without *H pylori* gastritis.

The lesions in high-grade MALT lymphoma tend to be more aggressive than those in low-grade MALT lymphoma. Differentiation of gastric MALT lymphoma from gastritis or gastric carcinoma is extremely difficult, especially in cases of low-grade lymphoma.

At endoscopy, the lesions affected the body and the antrum and consisted of an irregular and large ulcer with raised edges and erosions, small nodules, and localized or diffuse rugal thickening [22].

Early gastric lymphoma was defined as lymphoma invasion limited to the mucosa or the submucosa of the stomach wall, regardless of the presence of lymph node metastases [24]. These tumours usually manifested as localized smooth enlargement of the rugae, poorly defined shallow ulcers, or well-defined deep ulcers. The ulcers were usually associated with mucosal convergence, enlargement of the rugae, and smooth marginal elevation. Multiple lesions were

noted in 40%–50% of cases [23, 24]. Kitamura *et al.* [23] reported that five of 10 early gastric lymphomas had pathologic features of MALT lymphoma.

Early lymphoma that arises from the lymphatic tissue in the deeper layer mainly produces submucosal tumour growth, and desmoplastic reaction is rare. Therefore, smooth enlarged rugae with slight convergence indicating the submucosal nature of early lymphoma and poorly defined ulceration indicating poor desmoplastic reaction were findings suggestive of early lymphoma [24].

Kitamura *et al.* [23] reported a higher prevalence of multifocal lesions in early gastric lymphoma than in gastric carcinoma. Our results suggest that disorganized convergent rugae, vague ulcer margins, and multiple lesions may be useful in differentiating low-grade gastric MALT lymphoma from gastric carcinoma, especially the ulcerative type.

Conclusion

Gastrointestinal lymphoma is an uncommon disease with a wide variety of imaging appearances. Although there is no characteristic appearance, features such as a bulky mass or diffuse infiltration with preservation of fat planes and no obstruction, multiple site involvement, and associated bulky lymphadenopathy are suggestive of lymphoma.

The most commonly used imaging modalities are barium examination and CT, which are complementary. However, CT is the most useful modality in that it provides a better overall assessment of the disease stage.

We believe that CT performed with this method is a useful non-invasive method for preoperative evaluation and staging of gastric lymphoma and should be used before surgery is planned.

REFERENCES

1. Dawson IM., Cornes JS., Morson BC. (1961): Primary malignant tumors of the intestinal tract. *Br J Surg*; 49: 80–89.
2. Yoo CC., Levine MS., McLarney JK., Rubesin SE., Herlinger H. (2000): Value of barium studies for predicting primary versus secondary non-Hodgkin's gastrointestinal lymphoma. *Abdom Imaging*; 25: 368–372.
3. Crump M., Gospodarowicz M., Shepherd FA. (1999): Lymphoma of the gastrointestinal tract. *Semin Oncol*; 26: 324–337.
4. Aozasa K., Tsujimoto M., Inoue A. *et al.* (1985): Primary gastrointestinal lymphoma. *Oncology*; 42: 97–103.

5. An SK., Han JK., Kim YH. *et al.* (2001): Gastric mucosa-associated lymphoid tissue lymphoma: spectrum of findings at double-contrast gastrointestinal examination with pathologic correlation. *RadioGraphics*; 21: 1491–1504.
6. Rohatiner A., d'Amore F., Coiffier B. *et al.* (1994): Report on a workshop convened to discuss the pathological and staging classifications of gastrointestinal tract lymphoma. *Ann Oncol*; 5: 397–400.
7. Gossios K., Katsimbri P., Tsianos E. (2000): CT features of gastric lymphoma. *Eur Radiol*; 10: 425–430.
8. Yoo CC., Levine MS., Furth EE. *et al.* (1998): Gastric mucosa-associated lymphoid tissue lymphoma: radiographic findings in six patients. *Radiology*; 208: 239–243.
9. Park MS., Kim KW., Yu JS. *et al.* (2002): Radiographic findings of primary B-cell lymphoma of the stomach: low-grade versus high-grade malignancy in relation to the mucosa-associated lymphoid tissue concept. *AJR Am J Roentgenol*; 179: 1297–1304.
10. Choi D., Lim HK., Lee SJ. *et al.* (2002): Gastric mucosa-associated lymphoid tissue lymphoma: helical CT findings and pathologic correlation. *AJR Am J Roentgenol*; 178: 1117–1122.
11. Buy JN., Moss A. (1982): Computed tomography of gastric lymphoma. *AJR Am J Roentgenol*; 138: 859–865.
12. Miller FH., Kochman ML., Talamonti MS., Ghah-remani GG., Gore RM. (1997): Gastric cancer: radiologic staging. *Radiol Clin North Am*; 35: 331–349.
13. Levine MS., Pantongrag-Brown L., Aguilera NS., Buck JL., Buetow PC. (1996): Non-Hodgkin lymphoma of the stomach: a cause of linitis plastica. *Radiology*; 201: 375–378.
14. Cho KC., Baker SR., Altemann DD., Fuscoo JM., Cho S. (1996): Transpyloric spread of gastric tumors: comparison of adenocarcinoma and lymphomas. *AJR Am J Roentgenol*; 167: 467–469.
15. Wyatt JI., Rathbone BJ. (1988): Immune response of the gastric mucosa to *Campylobacter pylori*. *Scand J Gastroenterol Suppl*; 142: 44–49.
16. Eidt S., Stolte M., Fischer R. (1994): *Helicobacter pylori* gastritis and primary gastric non-Hodgkin's lymphomas. *J Clin Pathol*; 47: 436–439.
17. Levine MS., Elmas N., Furth EE., Rubesin SE., Goldwein MI. (1996): *Helicobacter pylori* and gastric MALT lymphoma. *AJR Am J Roentgenol*; 166: 85–86.
18. Montalban C., Castrillo JM., Abaira V. *et al.* (1995): Gastric B-cell mucosa-associated lymphoid tissue (MALT) lymphoma: clinicopathological study and evaluation of the prognostic factors in 143 patients. *Ann Oncol*; 6: 355–362.
19. Castrillo JM., Montalban C., Obeso G., Piris MA., Rivas MC. (1992): Gastric B-cell mucosa associated lymphoid tissue lymphoma: a clinicopathological study in 56 patients. *Gut*; 33: 1307–1311.
20. Kessar P., Norton A., Rohatiner AZ., Lister TA., Reznik RH. (1999): CT appearances of mucosa-associated lymphoid tissue (MALT) lymphoma. *Eur Radiol*; 9: 693–696.

21. Kim YH., Lim HK., Han JK. *et al.* (1999): Low-grade gastric mucosa-associated lymphoid tissue lymphoma: correlation of radiographic and pathologic findings. *Radiology*; 212: 241–248.
22. Blazquez M., Haioun C., Chaumette MT. *et al.* (1992): Low grade B cell mucosa associated lymphoid tissue lymphoma of the stomach: clinical and endoscopic features, treatment, and outcome. *Gut*; 33: 1621–1625.
23. Sato T., Sakai Y., Ishiguro S., Furukawa H. (1986): Radiologic manifestations of early gastric lymphoma. *AJR*; 146: 513–517.
24. Morrison S., Dahms BB., Hoffenberg E., Czinn SJ. (1989): Enlarged gastric folds in association with *Campylobacter pylori* gastritis. *Radiology*; 171: 819–821.

Резиме

СТ ЕВАЛУАЦИЈА НА ГАСТРИЧЕН ЛИМФОМ

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Целта на студијата е да се одреди вредноста на компјутеризираната томографија (СТ) во индуцирана хипотонија и исполнување на желудникот со вода во дијагностика и предоперативен стејџинг на 27 пациенти со гастричен лимфом (GLy) потврден со ендоскопска биопсија.

СТ скеновите беа изведени во положба на супинација и пронација во индуцирана хипотонија и исполнување на желудникот со 500–700 mL вода и и.в. апликација на нејонско контрастно средство. Положбата во пронација и индуцираната хипотонија, овозможуваат визуелизација на сидот на целиот желудник, ги превенираат артефактите од присутниот воздух, кои обично се јавуваат за време на прегледот во положба на супинација.

СТ скеновите беа анализирани во однос на дебелината на стомачниот сид, задебелување на слузничките набори, присуство на инфилтрација на сидот, нодуларност на мукозата, улцерации, туморски маси, регионално ширење на туморот, депозити во лимфните јазли и присуство на далечни метастази. Најчест наод кај GLy беше улкус со различна големина и длабочина кој беше застапен кај 43% од случаите, потоа следуваше ТУ маса со или без улцерација кај 36% од случаите и задебелување на слузничките набори кај 21% од случаите. Според СТ наодот, GLy беше градиран во четири групи: I, II, III и IV. Прецизен предоперативен стејџинг беше постигнат кај 73%, надценување кај 18% и потценување кај 9% од пациентите. Сензитивноста и специфичноста на техниката беше 93% и 85%. Нискостепениот МАЛТ лим-

фом беше застапен кај 69%, додека високостепениот МАЛТ лимфом беше застапен кај 31% од случаите.

Ние веруваме дека СТ изведен со овој метод е корисен неинванзивен метод за предоперативна евалуација и стејдинг на гастричниот лимфом и треба да се користи пред да биде испланиран оперативниот третман.

Клучни зборови: СТ, гастричен лимфом, MALT лимфом, стејдинг.

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