

Comparison between spiral computed tomography and transabdominal ultrasound in the evaluation of gastric lesions

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By

Engy Showky Ahmed Mohamed Ali ElKayal

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Supervised by:

Prof. Dr. Tarek H. Khalil

Professor of Radiology
Faculty of medicine
Suez Canal University

Prof. Dr. Khalil A. Khalil

Prof. & chairman of internal medicine
Faculty of medicine
Suez Canal University

Dr. Gehad Ibrahim Abd-ElRahman Ahmed

Lecturer of Radiodiagnosis
Faculty of medicine
Suez Canal University

Faculty of Medicine

Suez Canal University

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Summary

Accurate diagnosis of gastric lesions can help in accurate management of these lesions. Ultrasound and spiral computed tomography is different types of non-invasive imaging modalities that can be used to diagnose different types of gastric lesions. Measuring the accuracy of all of these non-invasive imaging modalities in diagnosis of gastric lesions is very important to choose the best modality to diagnose such lesions.

Our study purpose is to estimate the diagnostic accuracy and criteria of spiral computed tomography and transabdominal ultrasound in detecting and evaluating gastric mucosal lesions and gross gastric mass lesions. Endoscopy & Histopathology were used as gold standard for comparison. Observations with ultrasound with ingestion of water can provide clear visualization of the gastric wall for assessment of wall thickness and stratification without interference from intraluminal gas. Water ingestion allows evaluation of compressibility of gastric wall. The wall of the stomach may be obscured by positive contrast agents due to the contiguity of the high attenuation contrast agents with the intravenous contrast agent-enhanced wall. Negative contrast agents adjacent to the contrast-enhanced gastric wall do not have this limitation and allow detailed depiction of gastric pathology. Tap water as a negative oral contrast agent is safe and well tolerated by patients.

Thirty six patients were included in the study (22 males & 14 females) with mean age 55 years old ranged from (25-85 Y) with the following clinical presentation: epigastric discomfort, anorexia, nausea and dyspepsia, epigastric fullness, loss of appetite, nausea, vomiting, dyspepsia, cachexia, pallor, and palpable mass. Fourteen patients had benign (inflammatory) lesions representing thirty nine percent of this study. Twenty two patients had malignant lesions representing sixty one percent of this study. Endoscopic biopsy was obtained from all cases in our study. Fourteen patients representing our benign cases proved to have gastritis by biopsy. Our 22 malignant cases had the following pathological diagnosis: Eleven cases (31%) had adenocarcinoma, 4 cases (11%) had lymphoma, 4 cases (11%) had GIST and 3 cases (8%) were metastatic. Transabdominal ultrasound, spiral computed tomography, upper GIT endoscopy & pathology were done to all patients who had gastric lesion. Ultrasound was correctly diagnosed 9 cases (64%) from our 14 benign cases and 18

cases (81%) from our 22 malignant cases. Nine patients in our study had normal gastric US examination. Spiral computed tomography was correctly diagnosed 10 (71%) cases from our 14 benign cases and 20 cases (91%) from our 22 malignant cases. Six patients in our study had normal gastric CT examination.

***Ultrasound findings:**
Ultrasound showed 75% accuracy in detection of gastric lesions either benign or malignant. It was correctly diagnose and discovered 27 cases of gastric lesions, however, it failed to discover and diagnose 9 cases from our 36 studied patients.

Twenty-one of them (78%) had focal thickening, while, only six cases (22%) had diffuse thickening. Eight cases had eccentric (asymmetrical) wall thickening out of 26 cases with focal thickening, while the remainder had circumferential (symmetrical) thickening.

Twelve (63%) malignant cases infiltrated all layers of gastric wall, while most benign cases (6 cases) involved only the mucosa and submucosa of the gastric wall. This means that malignant cases infiltrates all gastric layers, while benign cases rarely involved gastric wall beyond submucosal layer. Gastric wall stratification was preserved in all benign cases and only in 58% of malignant cases, while gastric wall stratification was obliterated in 42% of malignant cases. This means that obliteration of gastric wall stratification may be a reliable US sign of malignancy. Positive gastric compressibility in US was noted in all benign cases and about 50% of malignant cases, while the other 50% of malignant cases showed loss of gastric compressibility. Thus loss of gastric compressibility in US may be a reliable sign for malignancy.

Preserved perigastric fat in US was noted in all benign cases and about 58% of malignant cases, while, it was obliterated in 42% this means that US obliteration of perigastric fat can be a reliable US for malignancy.

Criteria of differentiation between benign (inflammatory) & malignant (neoplastic) gastric lesions at US:

***Benign Lesions:**

- Small volumes of focal lesions.
- Diffuse wall thickness ranged 9 mm.
- Benign lesions rarely involved gastric wall beyond submucosal layer.
- Wall stratification was preserved in benign lesions.
- Compressibility was positive in benign lesions.
- Preservation of perigastric fat.

***Malignant lesions:**

- Large volumes of focal lesions.
- Diffuse wall thickness ranged 18 mm.
- Malignant lesions infiltrate all gastric layers.
- Obliteration of gastric wall stratification.

- Loss of gastric compressibility.
- Loss of perigastric fat.

*CT Findings:

CT showed 83 % accuracy in detection of gastric lesions either benign or malignant. It was correctly diagnose and discovered 30 cases of gastric lesions, however, it failed to discover and diagnose 6 cases from our 36 studied patients. Twenty-six of them (87%) had focal thickening, while, only four cases (13%) had diffuse thickening. Ten cases had eccentric (asymmetrical) wall thickening out of 26 cases with focal thickening, while the remainder had circumferential (symmetrical) thickening.

Fourteen malignant cases out of 21 had significant wall enhancement, while only 5 benign cases out of 9 had also wall enhancement. The gastric wall thickening involves only mucosal and submucosal layers in all benign lesions with no extension beyond submucosal layer detected, while in 15 cases of malignant lesions the thickening involves all gastric layers and extends beyond perigastric fat. Thus, there is significant multi-layer involvement in malignant lesions.

Involvement of perigastric fat was noted in 10 malignant cases out of 21, while, it was preserved in the remainder malignant cases and all benign cases. This means that in all benign lesions no suspicious involvement of perigastric fat detected.

Criteria of differentiation between benign (inflammatory) & malignant (neoplastic) gastric lesions at CT:

*Benign Lesions:

- Diffuse wall thickness ranged 11 mm.
- Benign lesions rarely involved gastric wall beyond submucosal layer.
- Preservation of perigastric fat.

*Malignant lesions:

- Diffuse wall thickness ranged 16 mm.
- Malignant lesions infiltrate all gastric layers.
- Loss of perigastric fat.