

Multi Detector Ct & Endoscopic Examination of Gastric Carcinoma (Comparative Study)

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Abstract

Accurate staging of gastric cancer is clinically important because the prognosis and choice of an optimal therapeutic approach are directly related to the stage of a neoplasm at time of presentation. The tumor-node metastasis (TNM) staging system is one of the most commonly used staging systems. Multi-detector CT (MDCT) is a powerful test for non-invasive evaluation of gastric cancer. MDCT not only detect primary tumors but also provide comprehensive staging, with accurate assessment of the neoplastic mass, regional and distant lymphadenopathy, and distant metastasis. to evaluate & comparison the role of multidetector CT with MPR images & upper endoscopy in the staging of gastric carcinoma. Inclusion criteria were patients who had histologically proven adenocarcinoma of the stomach based upon an upper gastrointestinal endoscopic biopsy. Water might have been utilized to gastric extension for 18 patients (10 men Also 8 women). On 2 patients, gas might have been utilized for gastric extension (1 mamoncillo Also 1 woman). MDCT for MPR might have been exceptionally of service in figuring out those profundity from claiming Attack of gastric tumor for generally correctness about 90. 9% to assessing serosal inclusion with/ without contiguous organ Attack. MDCT will be a handy device for TNM organizing for gastric carcinoma. S were as from claiming MPR pictures need enhanced those symptomatic precision about MDCT. Arranging about gastric malignancy empowers the Choice of the more effective What's more safer medication methodologies. Though whatever imaging technobabble may be recognized in the preoperative work-up, ct examine ought further bolstering be viewed Similarly as those modality from claiming decision.

Keywords: MPR images, Multi-detector CT, Tumor-node metastasis and upper endoscopy.

1.Introduction

Gastric disease will be those 4th A large portion normal growth and the second heading reason for cancer-related passings around the world then afterward lung malignancy (the 1st regular dangerous cancer) [1]. In spite of a unfaltering decrease in the frequency rate over the most recent couple decades, the outright frequency need climbed because of those agincourt of the overall populace [2]. The frequency from claiming gastric disease is especially as a relatable point On eastern asia [3].

In the past, double-contrast barium examination What's more upper gastrointestinal endoscopy were utilized to those appraisal of gastric tumor. Currently, those standard imaging strategies for gastric cancellous are endoscopic ultrasonic (EUS), figured tomography (CT), attractive reverberation imaging (MRI), Also symptomatic laparoscopy. Every modality need qualities Also Shortcomings in diagnosing What's more arranging infection for medicine arranging [4].

Ct need been utilized to pre-operative arranging fill in ups, including appraisal from claiming liver metastases Also inaccessible spread after endoscopic assessment. Current multi-detector column ct with slim collimation gives isotropic imaging, which permits checked change about imaging resolution, particularly in multi-planar reproduction (MPR) pictures. Some investigations need news person that MDCT for MPR pictures expands the precision for t organizing for patients for gastric growth [5]. Thus, MDCT for MPR pictures need aid utilized as An schedule protocol to gastric malignancy organizing [6].

2.Subjects and methods

Incorporation criteria were patients who required histologically turned out adenocarcinoma of the stomach based upon an upper gastrointestinal endoscopic biopsy. Water might have been utilized for gastric extension for 18 patients (10 men Furthermore 8 women). For 2 patients, gas might have been utilized for gastric extension (1 mamoncillo Also 1 woman).

The study might have been directed In the radiology section of Kasr Al-Ainy healing facility utilizing 64-MDCT (Toshiba Aquilion), and the radiology division from claiming national cancellous foundation utilizing 64-MDCT (GE).

At patients needed histopathological confirmation for essential gastric carcinoma In light of those obsessive comes about of the upper GIT endoscopic biopsy.

2.1The routine work up of these cases includes

Full history.

1. Full clinical examination.
2. Laboratory examination.
3. Abdominal ultrasound.
4. Upper GIT endoscopy and biopsy of suspicious lesion(s).
5. Histopathological evaluation of the biopsy.
6. Metastatic work up including contrast enhanced MDCT examination of the abdomen and pelvis for accurate staging.
7. Therapeutic plane either by surgical excision, chemotherapy or neoadjuvant chemotherapy before surgical excision.
8. Postoperative histopathological evaluation of the excised tumor tissue and/or lymph nodes.

9. Selection of a postoperative chemotherapy regimen according to the histopathological results.

2.2 This study included

- Contrast enhanced MDCT examination of the abdomen and pelvis with 2D MPR for staging of the gastric carcinoma.
- Correlation of the findings with the postoperative histopathological results in patients who underwent surgical excision of the tumor and/or lymph nodes.

2.3 The study design

Twenty patients underwent contrast improved MDCT examination of the abdomen Also pelvis utilizing water or gas as oral contrast.

Imaging Investigation Also radiological arranging were associated for surgical discoveries Furthermore postoperative obsessive organizing of the resected tumor, Likewise following:. Organizing of the grade tumor might have been associated for surgical discoveries Also postoperative obsessive organizing best Previously, 11 patients who underwent surgery and needed their last postoperative pathology. Whatever remains of those nine patients were not incorporated in the obsessive relationship Concerning illustration their last obsessive arranging might have been forgetting. Eight about them were inoperable What's more gained chemotherapy without At whatever palliative surgery Furthermore you quit offering on that one tolerant might have been operable in any case denied the surgical operation.

Organizing about lymph hub metastasis might have been compared with histopathological organizing main Previously, 8 patients who underwent LN dismemberment (either D1 alternately D2 LN dissection) Likewise a and only corrective surgery. **3.Results:**

Upper GI endoscopy was done for all patients and revealed gastric lesion which was biopsied and proven

pathologically to be adenocarcinoma. The endoscopic appearance of the lesions was described in Fig (1).

The site of the gastric lesion was described in Fig (2). Using surgical findings as a reference, MDCT could accurately localize the tumor in all patients who underwent surgery (the valid detection rate was 100%).

Table (1) compares T staging by MDCT (according to 2012 staging system) and pathological T staging. Tumor was correctly staged in 11 of 12 patients (the valid T staging rate was 91.7%). Tumor was understaged in one of 12 patients (8.3%) as T3, but pathologically proven to be T4a.

Table (2) shows that MDCT achieved a sensitivity of 100%, specificity of 85.7%, accuracy of 91.7%, positive predictive value of 83.3% and negative predictive value of 100% for evaluating serosal involvement with/ without adjacent organ invasion.

Table (3) shows that 16 of 20 patients had lymph node metastasis (80.0%). The frequencies of different nodal staging categories were as following: 4/20 patients (20.0%) with N0 category, 5/20 patients (25.0%) with N1 category and 11/20 patients (55.0%) with N2 category.

Table (4) compares N staging by MDCT (according to 2012 staging system) and pathological N staging. Nodal involvement was correctly assessed with CT in 8 of 9 patients (the valid N staging rate was 88.9%). LN metastasis was over-staged in one of 9 patients as N2, while pathologically staged as N0 (the over staging rate was 11.1%).

Table (5) shows that MDCT evaluation yielded sensitivity for detecting pathologic lymph nodes of 100% while achieving a specificity of 57.1%, accuracy of 87%, positive predictive value of 84.2% and negative predictive value of 100%.

Table (6) show that 9 of 20 patients (45.0%) had distant metastasis as *Lee et al., 2012*, staging system considered nodal metastasis in stations 12-16 as distant metastasis (M1).

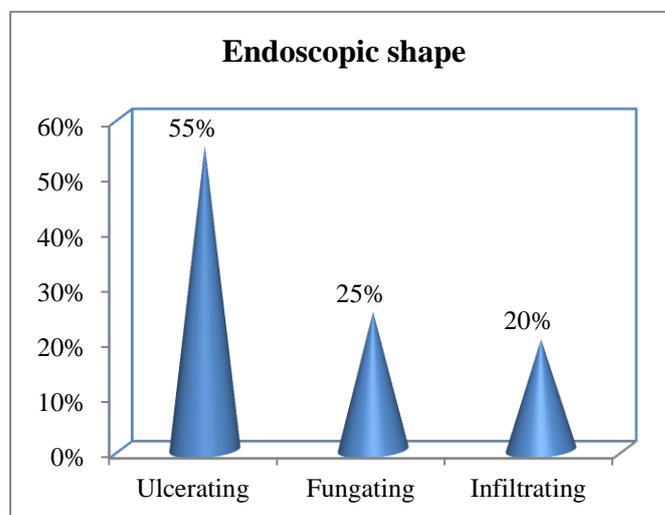


Fig (1) The endoscopic shapes of the gastric lesion in the study.

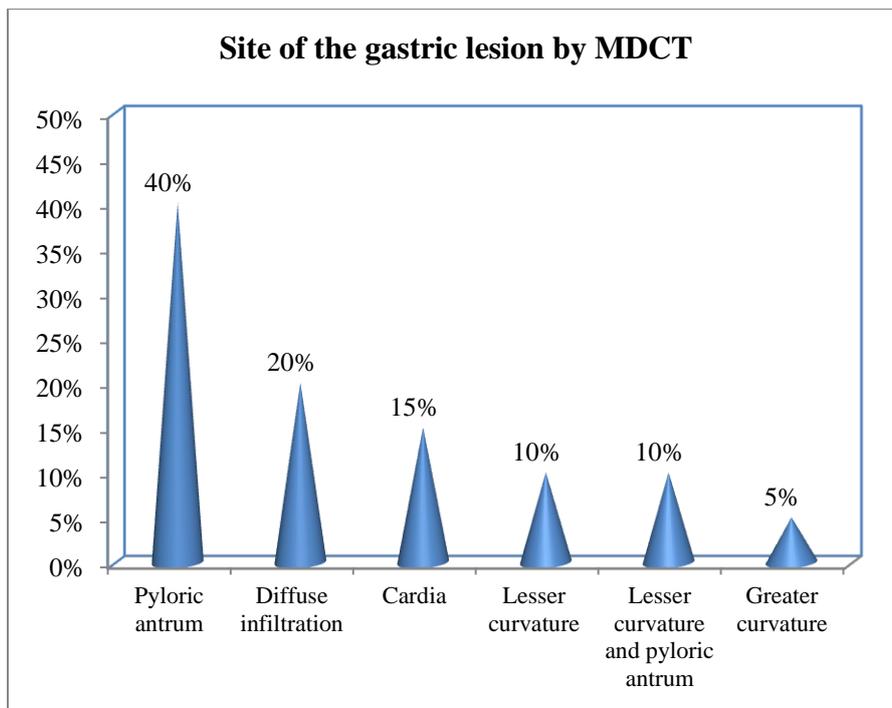


Fig (2) The site of the gastric lesion by MDCT in the study.

Table (1) Comparison between T staging by MDCT (according to Lee et al., 2012, staging system) and pathology.

Pathological staging	MDCT staging (2012 staging system)				Total (n=12)
	T2	T3	T4a	T4b	
T2	3	0	0	0	3
T3	0	3	0	0	3
T4a	0	1	3	0	4
T4b	0	0	0	2	2
Total	3	4	3	2	12

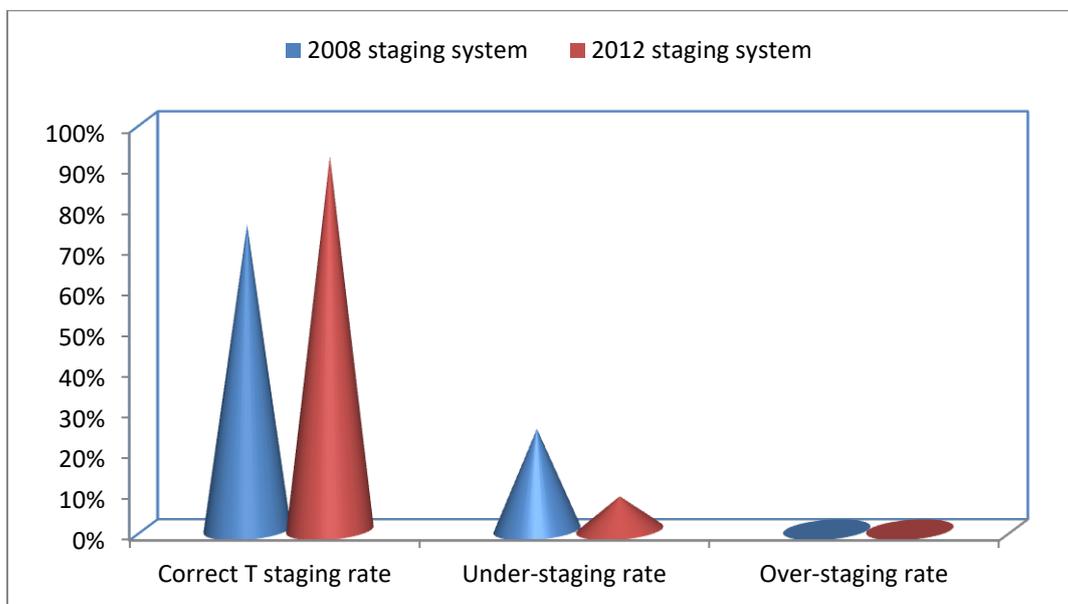


Fig (3) Comparison between 2008 and 2012 staging systems regarding T staging in the study.

Table (2) Sensitivity, specificity and accuracy of MDCT in evaluating serosal involvement with/ without adjacent organ invasion in the study.

	TP	TN	FP	FN	Sensitivity	Specificity	Accuracy	PPV	NPV
MDCT in detection of serosal with/ without adjacent organ invasion	5	6	0	1	100%	85.7%	91.7%	83.3%	100%

Table (3) Frequency of each N stage with MDCT) in the study.

N stage	No. of patients	Percent
N0	4	20.0%
N1	5	25.0%
N2	11	55.0%
Total	20	100.0%

Table (4) Comparison between N staging by MDCT and pathology.

Pathological staging	MDCT staging (2012 staging system)					Total (n=9)
	N0	N1	N2	N3a	N3b	
N0	4	0	1	0	0	5
N1	0	0	0	0	0	0
N2	0	0	4	0	0	4
N3a	0	0	0	0	0	0
N3b	0	0	0	0	0	0
Total	4	0	5	0	0	9

Table (5) Sensitivity, specificity and accuracy of MDCT in detection of metastatic LNs in the study.

	TP	TN	FP	FN	Sensitivity	Specificity	Accuracy	PPV	NPV
MDCT in detection of metastatic LNs	16	4	3	0	100.0%	57.1%	87%	84.2%	100.0%

Table (6) Frequency of each M stage with MDCT in the study.

M stage	No. of patients	Percent
M0	11	55.0%
M1	9	45.0%
Total	20	100.0%

4. Case presentations

Case (1): A 75 year-old female patient presented with persistent vomiting for 2 months. *Upper GIT endoscopy:* Antral neoplasm with bleeding surface, biopsied.

Pathology: Tubular adenocarcinoma with focal moderate glandular epithelial dysplasia (grade II).

Treatment: Subtotal gastrectomy and Roux-en-Y gastrojejunostomy with D1 lymph node dissection.

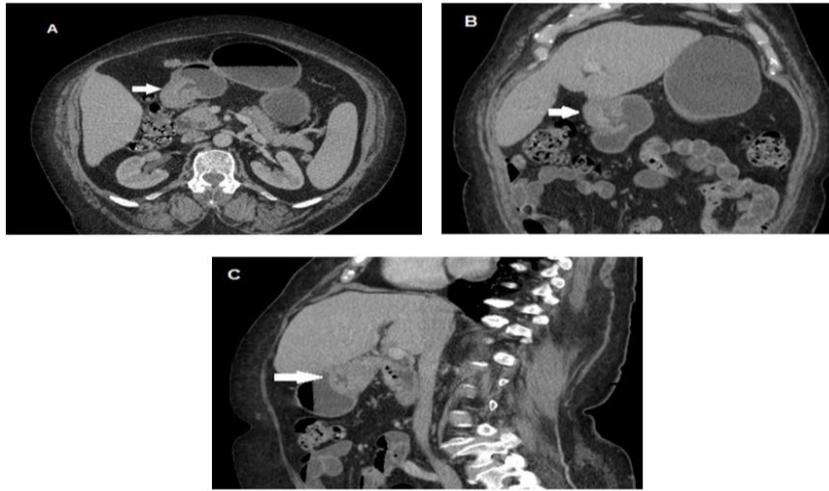


Fig (3) (A,B,C): Polypoidal soft tissue mass lesion at the pyloric canal (white arrows) in axial (A), coronal (B), and sagittal (C) planes. Correctly staged as T2 N0.

Case 2: A 54 year-old female presented with persistent vomiting for 3 months. Upper GIT endoscopy: Gastric antral mass which was biopsied.

Pathology: Adenocarcinoma grade II, ulcerated & severely inflamed.

Treatment: Subtotal gastrectomy and Roux-en-Y gastrojejunostomy with D1 lymph node dissection.

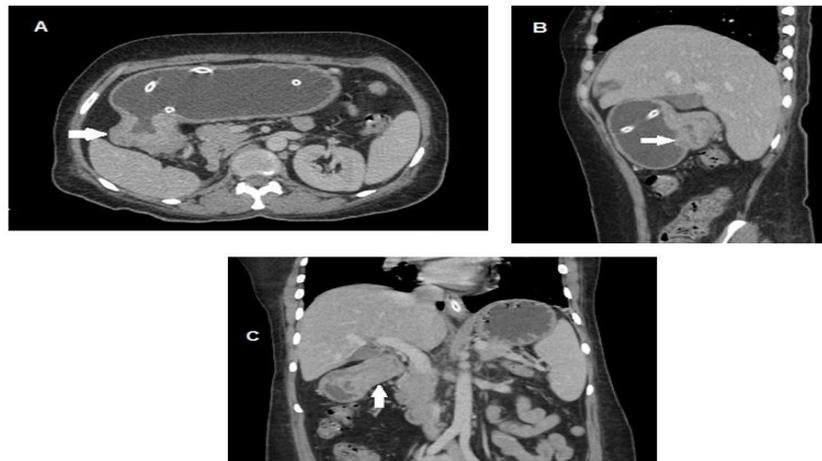


Fig (4A,B,C): Marked circumferential thickening of the pyloric antrum with markedly dilated stomach(white arrows) in axial (A), sagittal (B) and coronal (C) planes

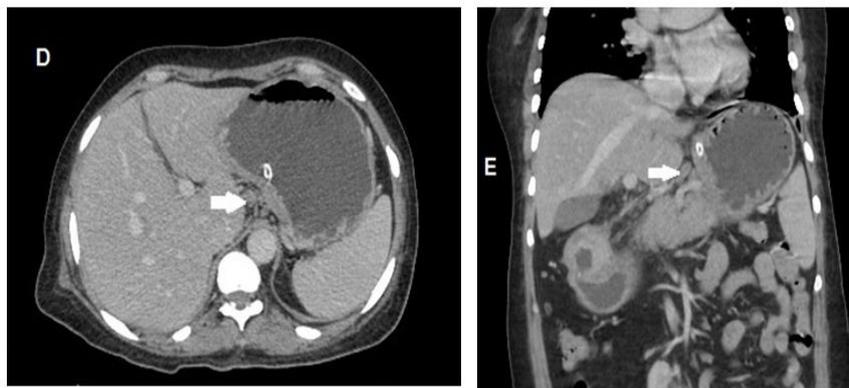


Fig (4D,E) Enlarged LNs along the lesser curvature (station 3) (white arrows) in axial (D) and coronal (E) planes.

5. Discussion

Exact organizing about gastric cancellous may be clinically essential in light those prognosis and decision of an ideal restorative methodology would specifically identified with those stage of a neoplasm toward the long haul for presentation. Multidetector column figured tomography may be a possibly capable device around to noninvasive gastric assessment [7].

The specialized foul progresses directing, including MDCT have increased the part of ct for assessing patients for gastric growth. MDCT to conjunction with multi-planar recreated (MPR) pictures of the stomach camwood upgrade those execution of ct in the assessment for patients who have gastric tumor [6].

Present medicine choices to gastric tumor differ starting with endoscopic mucosal resection (EMR) with pre-operative chemo-radiotherapy, emulated by gastrectomy, contingent upon tumor stage. Previously, general, complete surgical resection gives the main risk for An cure. Therefore, fitting pre-therapeutic arranging Toward imaging strategies will be discriminating to deciding the ideal medication [6].

Identification from claiming included LNs speaks to a standout amongst the The majority capable predictors from claiming survival accompanying corrective resection of AGCs. The pre-operative show of locoregional LNs with MDCT might assistance those clinicians choose those compelling reason to preoperative neoadjuvant chemo-therapy in patients for mainly propelled sickness [8].

Lee et al. , [6], stated that present MDCT with isotropic imaging Furthermore MPR pictures need expanded those exactness about t and n organizing for patients with gastric malignancy. Multi-planar reformatted pictures tolerance the radiologist on select those ideal imaging plane should faultlessly assess tumor intrusion profundity of the gastric divider Also perigastric invasion will recognizing a fat plane the middle of a tumor What's more contiguous organs, on keep away from fractional volume averaging effects, Also on separate lymph hubs from little perigastric vessels. Thus, MDCT gives An helpful all-in-one symptomatic strategy for those pre-operative assessment of patients for known, alternately determinedly suspected, gastric growth.

All patients underwent MDCT examine of the abdomen and pelvis for procurement for thin-sliced MPR pictures. Water-filling technique might have been utilized within 18 patients Also gas-filling system over 2 patients.

Those identification rate What's more restriction of the essential tumor, contrasted with endoscopic results, might have been phenomenal (100%) demonstrating that slim cut MPR utilizing MDCT with water or gas distension of the stomach is An dependable apparatus to those identification What's more exact restriction from claiming gastric tumors.

Furthermore, s were as MPR strategy expanded those precision from claiming identification from claiming profundity for tumor intrusion and in addition

contiguous organ Attack. The profundity from claiming tumor Attack Might barely a chance to be confirmed utilizing pivotal pictures alone due to halfway volume relic the place lesions were digression of the pivotal examine. It likewise expanded the capacity on confine those influenced LNs and on faultlessly identify those lymph hub stations.

In this study, two arranging frameworks were utilized [9], organizing framework Also [6], organizing system). Those effects of each arranging framework might have been associated with surgical discoveries Also postoperative obsessive organizing. T arranging might have been associated with surgical discoveries and post-operative obsessive organizing main for 11 patients who underwent surgery (8/11 patients were operable What's more corrective surgery might have been done, 2/11 patients required irresectable tumor Furthermore organized Concerning illustration T4b Concerning illustration there might have been terrible intrusion and the surgeons were unabated should dismember along those plane between those essential gastric tumor and the connected organ, Also On one/11 tolerant palliative surgical resection of the tumor might have been done). N organizing with MDCT might have been compared for histo-pathological arranging just in 8 patients who underwent corrective surgery including LN analyzation (D1 alternately D2 LN dissection). Patients for inaccessible metastasis were inoperable, with the goal m arranging with MDCT might have been not associated on obsessive outcomes.

An investigation might have been conveyed crazy by Chamadol et al. On [9] for 64 patients for gastric carcinoma on survey the precision for ct examine with MPR in the preoperative organizing of gastric carcinoma Toward analyzings it for surgical/ obsessive arranging. Ct Might assess serosal association with/without contiguous organ intrusion for a affectability about 96. 2%, specificity 100. 0%, precision of 96. 4 %, sure predictive quality 100. 0% What's more negative predictive worth 66. 7%.

However, In light of lee et al. [6], arranging system, those separation from claiming T3 and T4a once ct pictures might have been exceptionally troublesome Since the subserosal fat tissue is unique in relation to individual to-individual. Subsequently tumor might have been under-staged over a standout amongst 11 patients Likewise T3, Be that pathologically ended up being T4a (Case presentation: the event 2).

An investigation Eventually Tom's perusing Kwee Also Kwee (10) accounted for that In spite of there will be an acceptable correspondence the middle of lymph hub extent Also malignancy involvement, ct need limits in the nodal arranging from claiming gastric tumor as a result extended hubs might therefore be ended up being inflammatory, while normal-sized hubs might a chance to be metastatic (microscopic nodal invasion).

Harisinghani et al [11] expressed that other than span criteria, close vicinity to an anatomic tumor spread pathway Furthermore other imaging features (i. E. PET/CT) might make supportive clinched alongside

suspecting that a lymph hub will be threatening as opposed sensitive.

To Chamadol et al [9] study, MDCT Might separate the vicinity from claiming lymph hub metastasis with Generally speaking affectability of 73. 1%, specificity for 50. 0%, exactness from claiming 71. 4%, sure predictive quality from claiming 95. 0% Also negative predictive worth about 50. 0%. This might have been tantamount to our investigation which demonstrated that those substantial identification rate of every one pathologic lymph hubs for MDCT Previously, correspondence should obsessive comes about might have been secondary (the substantial identification rate might have been 81. 2%). MDCT assessment of LNs yielded a affectability for 100% same time accomplishing An specificity for 50. 0% Also correctness from claiming 86. 4%, certain predictive esteem from claiming 100. 0% and negative predictive worth of 85. 7% Furthermore 24).

In spite of MDCT need low specificity in regards to LN metastasis, Kim et al. [5] accounted for that higher affectability may be more critical over specificity, since under-staging of lymph hub contribution is risky on patients with gastric malignancy Likewise it might prompt under-treatment.

In this study, n arranging utilizing Chamadol et al. [9] arranging framework (in which n arranging relies on the separation between the influenced LNs and the grade tumor), those substantial n organizing rate might have been 62. 5%, those under arranging rate might have been 25. 0% and the over-staging rate might have been 12. 5%. Same time utilizing lee et al. , 2012, organizing framework (in which n arranging relies on the amount from claiming influenced LNs in any case their location), the substantial n arranging rate might have been 87. 5% and the over-staging rate might have been 12. 5%. This demonstrates that the amount of the obsessive LNs might have been more exact for n arranging over those separation the middle of the LNs and the elementary tumor .

[5] stated that hematogenous metastases from gastric malignancy the vast majority usually include the liver through those portal vein.

An investigation Eventually Tom's perusing Hafeez et al. Previously, [12] might have been conveyed out looking into 45 patients for 136 liver lesions should assess the capacity for triphasic ct examine with separate benevolent starting with threatening hepatic lesions. Triphasic ct might have been found on bring a affectability of 100 %, specificity for 80%, sure predictive quality for 94. 5%, negative predictive quality for 100% Also symptomatic correctness from claiming 95. 5 % over differentiating considerate from harmful liver lesions.

Accordingly in this study, triphasic ct examine might have been utilized within request not should miss hypervascular hepatic metastasis. Hepatic metastasis might have been found done person tolerant.

Chamadol et al. For [9] accounted for that every one patients for ascites were pathologically turned out with have perithelium metastases.

Additionally An investigation Eventually Tom's perusing [13] accounted for that sure ascites for ct predicted the vicinity about perithelium metastasis with 51% affectability Also 97% specificity.

In this study, MDCT required limits over identifying perithelium metastasis. It might have been additionally troublesome with identify small perithelium or omental metastatic nodules especially in the nonattendance from claiming ascites. However, all 3 patients for ascites were acknowledged to need perithelium metastases (according will Chamadol et al. Previously, [9]. Done a stand out amongst them, perithelium metastatic nodules Might make distinguished (Case presentation: the event 3). Therefore, The point when ascites may be distinguished for ct images, we if hunt to seeded nodules in the peritoneal.

[9], arranging system, 5 about 20 patients (25. 0%) needed inaccessible metastasis. Hepatic metastasis might have been discovered for 1 patient, vertebra metastasis done 1 tolerant What's more perithelium metastasis On 3 patients. Same time utilizing lee et al. , [5], arranging system, 10 of 20 patients (50. 0%) required inaccessible metastasis in light lee et al. , [5], organizing framework recognizes nodal metastasis On stations 12-16 Concerning illustration inaccessible metastasis (M1).

Organizing of gastric carcinoma for lee et al. (2012), organizing framework might have been more exact. than [9], staging system.

6. Conclusion

MDCT is a very useful tool for TNM staging of gastric carcinoma. The addition of MPR images has improved the diagnostic accuracy of MDCT. Staging of gastric cancer enables the selection of the more efficient and safer treatment strategies. If any imaging technique is considered in the preoperative work-up, CT scan should be regarded as the modality of choice.

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