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CT finding in neoplasms of Hepatobiliary system

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Abstract

The original and extent of mass lesion could be defined better the ultrasonography. Moving further currently multiphase contrast enhanced dynamic CT has shown promise in better characterization of the morphology of hepato-biliary tumors with its multiplanar reformats, and phase study. The prospective study will include 50 patients of hepato-biliary malignancies being treated at Tertiary care Hospital. Before commencing for CT examination all procedure, historical, clinical, laboratory data was recorded. Most common primary was from colorectal malignancy constituting 11 cases (39%), followed by gastric carcinoma (6 cases, 21%), pancreatic malignancy (3 cases, 11%). Majority of the hepatic metastatic nodules appear illdefined irregular iso to hypodense (21 out of 28 patients; 785%) on NCCT scan. And no/minimal enhancement noted after contrast study (17 out of 28 patients: 61%). Majority of the metastatic nodules are solitary (64%), and right lobe is most commonly involved (20 out of 28 patients (72%). The mean size of metastatic lesions encountered in our study was 4.2cm.

Keywords: CT findings, Neoplasms, Hepatobiliary system

Introduction

Hepato-biliary system is one of the largest systems in the body and is the site for a wide gamut of benign and malignant neoplasms. Liver is the most common site for metastatic neoplasms for primary tumors elsewhere. Prior to surgical treatment of liver tumors, it is important to detect, characterize, and accurately localize them, Improved detection and characterization can help to determine which hepatic tumors may be amenable to aggressive surgical techniques and which necessitate palliative treatment^[1,2].

The original and extent of mass lesion could be defined better the ultrasonography. Moving further currently multiphase contrast enhanced dynamic CT has shown promise in better characterization of the morphology of hepato-biliary tumors with its multiplanar reformats, and phase study^[3,4].

In determining the extent of disease process, the role of radiologist is to provide information that will help to decide whether the treatment should be directed towards palliative or curative, and whether the most appropriate mode of treatment is operative, endoscopic or percutaneous. With computed tomography vascular invasion, bony involvement and nodal status can also be assessed in a better way^[5,6].

Methodology

Selection of Case

The prospective study will include 50 patients of hepato-biliary malignancies being treated at Tertiary care Hospital. Before commencing for CT examination all procedure, historical, clinical, laboratory data was recorded CT scanning was performed on patient in two phases.

In the First phase scan was obtained with oral contrast only. 20 ml of water soluble iodine based agent diatrizoate meglumine (Gastrografin) diluted in 1 liter of water was given orally 3-4 hr. before the study to ensure good colonic opacification. An additional 20ml contrast agent in 1 liter was given 20 min. before CT study to opacify bowel.

In the second phase scans was obtained with non-ionic intravenous contrast, A bolus of 50 to 70 ml of non-ionic 300mg/ml of iodine concentration contrast material was used intravenously and scanning was started immediately.

Technique

The technique will include an AP topogram with patient in supine position and contiguous axial sections was taken up to pelvic outlet.

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The first CT scan will be started at the level of diaphragm and then the sequence was programmed to include liver, spleen, pancreas, kidney, gall bladder, spine and pelvic bones, urinary bladder, uterus, ovaries, abdominal and pelvic vessels and lymph nodes.

In the scanning technique 130 KVP and 70 mAs was used. At the level of diaphragm to pelvic inlet scans was obtained at 10mm interslice gap with slice thickness of 10mm. At the level of upper abdomen and site of lesion scans was obtained at 5mm interslice gap with slice thickness of 5mm.

Results

We studied 28 cases of metastatic lesions of liver from varying sites. Age of the cases ranged from 35yrs to 77yrs with mean age being 56yrs Female preponderance noted on our study with male to female ration of 10:18 (1:1.8). This female preponderance is due increased number of gynecological and breast cancer patients included in our study. Most common primary was from colorectal malignancy constituting 11 cases (39%), followed by gastric carcinoma (6 cases, 21%), pancreatic malignancy (3 cases, 11%). Majority of the hepatic metastatic nodules appear illdefined irregular iso to hypodense (21 out of 28 patients; 785%) on NCCT scan. And no/minimal enhancement noted after contrast study (17 out of 28 patients: 61%). Majority of the monastic nodules are solitary (64%), and right lobe is most commonly involved (20 out of 28 patients (72%). The mean size of metastatic lesions encountered in our study was 4.2cm.

Three patients with HCC were included in our study. Age of the patients ranged 50-67yrs with mean age of 57yrs. Males were twice the females in our study. Two patients were cirrhotic and one was HBS Ag + ve. Male patients had large necrotic heterogenous hypodense mass. Hypodensit noted on plain films and moderate to Strong contrast study. A female patient was HBS Ag + ve and presented as Multicentric HCC.

Gall bladder carcinoma was noted in 18 out of 22 biliary malignant tumors (82%). Age ranged from 40 to 85 yrs, with mean age of 61 yrs. There is definite female preponderance with male; female ratio of 1:5. Most common CT scan finding was intensely enhancing thickened GB wall (39%). Infiltrative/advanced GB Carinoma was noted in 11 out of 18 patients (61%); and the most common organ infiltrated was right lobe of liver (seg. IV & V). Gall stones were noted in 39% of cases. Five out of 18 patients (28%) with underlying GB carcinoma presented as cholecystis. 4 out of 5 were older then 60yrs. Incidence gall bladder carcinoma appears to be higher in this region of Rajasthan.

We studied three patients of cholangiocarcinoma. Age group ranged from 50yrs to 60yrs with mean age being 55 yrs. Male: Female ratio noted to be 2:1 Two patients had type 1 cholangiocarcinoma i.e Hilar cholangiocarcinoma which appeared as hypodense mass in porta with heterogenous enhancement on contrast study. The other patient showed irregular small polypoidal growth in distal CBD with dilated proximal CBD and IHBR i.e type 3 pattern.

We had a single patient of ampullary carcinoma, a 55yrs old female patient. Small hypodense mass in pancreatic head with dilatation of biliary radicals noted on computed tomography.

Table 1: Etiology

Etiology	No. of Patients	Percentage
Hepatic metastasis	28	52.0
GB Ca	18	34.0
HCC	3	6.0
Cholangio Ca	3	6.0
Peri ampullary Ca	1	2.0

Table 2: Age Distribution in GB carcinoma

Age group	No. of Patients	Percentage
40 – 55 years	3	17.0
55 – 70 years	8	44.0
70 – 85 years	7	39.0
Total	18	100.0

Table 3: Direct infiltration in GB carcinoma

Organs infiltrated	No. of Patients	Percentage
Right lobe	10	56.0
Head of pancreas	3	17.0
Left lobe	2	11.0
Duodenum	2	11.0
Others	1	6.0

Table 4: Primary sites of hepatic metastasis

Primary sites	No.of Patients	Percentage
Colorectal carcinoma	11	39.0
Ca. stomach	6	21.0
Pancreatic Ca	3	11.0
Ca. Breast	3	11.0
Ca. Ovary	2	7.0
Ca. cerviix	2	7.0
Ca. Lungs	1	4.0

Table 5: NCCT Findings of Hepatic Metastasis

NCCT Findings	No. of Patients	Percentage
Well defined hypodense	4	14.0
Illdefined iso to hypodense	21	75.0
Ill defined heterogenous	2	7.0
Ungrouped	1	4.0

Table 6: Number of Hepatic Metastasis

Number of metastatic nodules	No. of Patients	Percentage
Solitary	18	64.0
< 3 nodules	5	18.0
>3 nodules	5	18.0

Discussion

Three patients with HCC were included in our study. Age of the patients ranged from 50-67yrs with mean age of 57 yrs. Males were twice the females in our study.

5.4 cm is the mean size in our study A female patient was HBSAg + ve and presented as multicentric HCC. Two male patients were alcoholic. Signs of cirrhosis noted in two out of three patients. They had large necrotic heterogenous mass. Hypodensity noted Om plain films and moderate to strong contrast enhancement noted on contrast study.

Portal lymphadenopathy noted in two patients. Portal vein was invasion noted in one male patient (33%).

Gall bladder carcinoma was noted in 18 out 22 biliary malignant tumors (82%). age range from 40 to 85yrs, with mean age being 61 yrs. There is definite female

preponderance with male: female ratio 1:5 in our study, All the patients except one presented with right upper quadrant or epigastric pain. Majority of them had lump abdomen and jaundice. Based on CT findings we divided growth patterns of gall bladder carcinoma in to three types Type 1 – increased wall thickness(>3mm). Type 2- polypoidal mass endoluminally or Focal mass in gall bladder region with at least some Part of gall bladder is seen.

Type 3- no normal gall bladder is seen/mass completely replacing the GB. Type 1 is the most common variety noted in 7 out of 18 patients (39%) with wall thickness of 5mm or more.

Infiltrative/advanced GB carcinoma was noted in 11 out of 18 patients (61%). And the most common organ infiltrated was right lobe of liver (seg. IV & V), noted in 10 out of 18 patients (56%).

Two out of 18 patients (11%) had non-specific wall thickening of 5-7 mm. Follow up USG of those patients showed focal mass in the region of GB fossa, thus confirming early GB carcinoma presents as focal wall thickening.

Five out of 18 patients presented with pain abdomen and fever (28%). After CT scan diagnosis of acute cholecystitis they underwent cholecystectomy. Examination of surgical specimen showed underlying carcinoma. 4 out of 5 were older than 60yrs. GB carcinoma presenting as cholecystitis especially xanthogranulomatous and gangrenous cholecystitis.

We studied three cases of cholangiocarcinoma. Age group ranged from 50yrs to 60yrs with mean age being 55yrs.

Classically cholangiocarcinomas are classified in to three categories. Type 1 - Heterogenous enhancing hypodense (infiltrative) mass at hilum/porta involving both hepatic ducts, CHD and proximal CBD. Type 2 - Large intrahepatic mass located in liver and arising from small peripheral IHBR.

Type 3- Polypoidal mass filling and distending CBD (distal part) In our study two patients had type 1 cholangiocarcinoma. The other patient showed irregular small polypoidal growth in distal CBD with dilated proximal CBD and IHBR i.e type 3 pattern.

Our case findings are in accordance with other studies [7-10]

We had single case of ampullary carcinoma, a 55 yr old female patient. She presented with jaundice and pain abdomen. Small hypodense mass in pancreatic head with dilatation of biliary radicals noted. Post whipples showed adenocarcinoma/ampullary carcinoma.

Conclusion

Computed Tomography is a non invasive, readily available, easy to perform, non operator dependent modality with superb spatial resolution, ability to detect calcium and density discrimination. Therefore CT is a valuable tool with a very high diagnostic sensitivity and helps in early detection and management of hepatobiliary malignant tumors.

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