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## METASTATIC COLORECTACAL CARCINOMA, ASSOCIATED WITH PYOGENIC LIVER ABSCESS

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### ABSTRACT

**INTRODUCTION:** A liver abscess represents capsulated purulent focus in the liver parenchyma, due to bacterial, fungal or parasite invasion. In the recent years their frequency rate related to malignant diseases has increased, including abscesses in liver metastases.

**AIM:** We present four cases of metastatic colorectal carcinoma, associated with pyogenic liver abscess, which were treated in the Second Department of Surgery, St. Marina University Hospital, Varna.

**RESULTS:** We registered synchronous metastases and in two patients and the remaining two had metachronous metastases. The average age of our patients was 60 years (range 45-80). The patients were operated on and the following interventions were performed – in one - segmentectomy; in two - liver resection with right hemicolectomy; in one - incision, biopsy and drainage; and in one – percutaneous drainage. We established the following systemic complications: pleural effusion in one patient, in one – arrhythmia, subphrenic abscess – in two patients. The bacterial strains showed *K. pneumoniae* in one patient, two – sterile and in one *S. epidermidis*.

**DISCUSSION:** In the recent years a lasting tendency of increasing of the frequency rate of malignant diseases of the GIT has been observed. The liver abscesses complicating a malignant disease can be treated like an abscess due to benign pathology – via aspiration, drainage and antimicrobial therapy. Surgical treatment is applied in larger (more than 5 cm) abscesses or with colorectal cancer. The prognosis in these cases is unfavorable due to the malignant diseases and the higher frequency rate of the septic complications.

**Keywords:** *metastases, colorectal cancer, live metastases, abscess, liver abscess*

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### INTRODUCTION

A liver abscess represents a capsulated purulent focus in the liver parenchyma, due to bacterial, fungal or parasite invasion (1,2). The bacteria invade the liver parenchyma via hematogenic (most often portal) way, biliary infections, or by the gallbladder bed (1).

In the recent years their frequency rate related with malignant diseases increases including abscesses in liver metastases. In the recent years lasting increase of the frequency rate of malignant diseases of the GIT has been observed (3,4). Various diseases and different therapies can compromise the immune system such as malignancies chemotherapy and immunosuppressive therapy after transplantation, which can lead to higher risk of pyogenic liver abscess (PLA) (5).

Kai Qu and co. studied 96 cases of pylephlebitis abscesses associated with colorectal cancer in 2011. The most frequent localization of the tumor was in the sigmoid colon (40.9%), followed by the rectum (27.3%), ascending colon (18.2%), transversal (7.6%) and descending colon (6.0%). According to the liver abscesses in the liver, the majority of cases were with right lobe involvement – 66.7%, those with left lobe involvement were 18.2%, and such with both lobes being involved were 15.1% of the cases (Fig. 1) (6).

Usually an abscess of portal vein origin is secondary in portal bacteremia or pylephlebitis. This type represents 10-20% of all bacterial liver abscesses (3).

**AIM**

We present four cases of metastatic colorectal carcinoma, associated with pyogenic liver abscess,

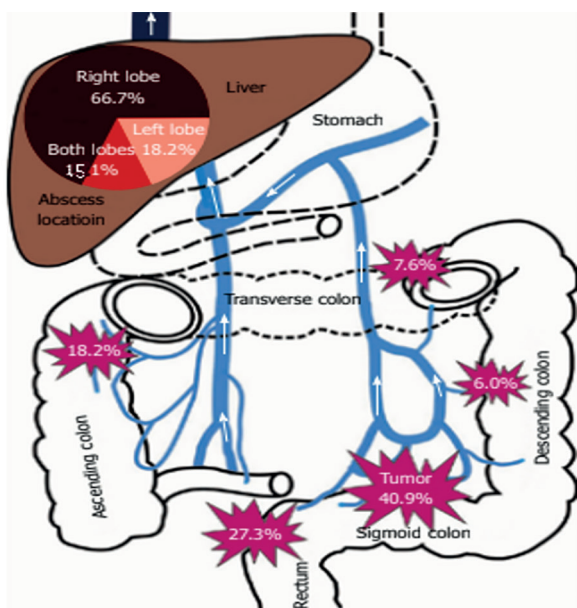


Fig. 1. Distribution of colorectal cancer and liver abscesses (6)

which were treated in the Second Department of Surgery, St. Marina University Hospital, Varna.

**MATERIALS AND METHODS**

For the period 2011 – 2018 we treated four patients with PLA associated with metastatic colorectal cancer. Three of them were men and one was a woman (3:1). They were urgently admitted and were at an average age of 62 years (range 45- 80).

The leading symptoms leading to the hospitalization of the patients were pain and heaviness in the right upper quadrant – 3 patients (75%), high fever – 3 patients (75%), tumor mass in the right upper quadrant – 2 patients (50%), dyspepsia – 2 patients (50%), and jaundice in 1 patients (25%). The imaging and instrumental methods we performed are demonstrated in Table 1.

Table 1. Imaging and instrumental methods

Imaging and Instrumental Methods	Number of Patients (4)	%
Computed tomography (CT) scan	4	100%
Ultrasound diagnostics (USD)	3	75%
X-ray of thorax	2	50%
X-ray of abdomen	2	50%
Fibrocolonoscopy	2	50%
USD of pleura	1	25%

In order to establish PLA as a diagnosis, we used data from past medical history, physical examination, image findings, laboratory and microbiological findings.

**RESULTS**

Using the imaging findings we determined the number and localization of the liver abscesses: 2 patients had single abscesses and 2 patients – multiple abscesses. Three patients had right lobe engagement. One patient had both lobes engaged (Fig. 2).

We used the CT scan to stage the colorectal cancer, in two patients. In these cases there were newly discovered colorectal carcinoma with suppurated metastases in the liver. One patient had ascending colon cancer and one was with hepatic flex-

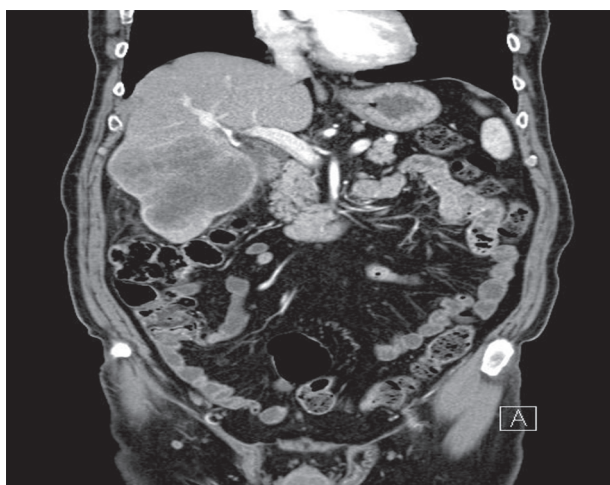


Fig. 2. CT of suppurated metastases in IV and V segments

abscess and the subphrenic abscess. The inoperative findings showed synchronous metastases in two patients and metachronous ones in two patients. In two of the patients the size of the abscesses was larger than 5 cm (Fig. 3).

Only one of the patients passed six courses of chemotherapy one year before the hospitalization.

We registered the following complications: abdominal - subphrenic abscesses in 2 patients, and systemic - pleural effusion in 1 patient and arrhythmia - 1 patient.

Table 2. Blood sample results

Nº	Index	Number	Deviation	%
1	AST↑	4	3	75%
2	ALT↑	4	3	75%
3	GGTP↑	4	3	75%
4	Protein↓	4	3	75%
5	WBC↑	4	2	50%
6	Alkaline phosphatase↑	4	1	25%
7	Hyperbilirubinemia	4	1	25%
8	Anemia (Hb↓, Er↓)	4	1	25%

ure carcinoma. We verified this histologically by fibrocolonoscopy. The blood sample results are shown in Table 2.

All patients had a specimen for microbiological test taken. The isolated causative agents were:

- ◆ sterile – 2 patients (50%)
- ◆ *Klebsiella pneumoniae* – 1 patient (25%)
- ◆ *Staphylococcus epidermidis* – 1 patient (25%).

The empirical antimicrobial therapy we applied in all patients included wide spectrum antibiotics and metronidazole. The patients were operated on.

The procedures we performed were:

- ◆ Segmentectomy – 1 patient
- ◆ Atypical liver resection with right hemicolectomy – 2 patients
- ◆ Incision, biopsy, drainage – 1 patient.

In one patient, after the percutaneous drainage, we conducted a laparotomy due to a rupture of the

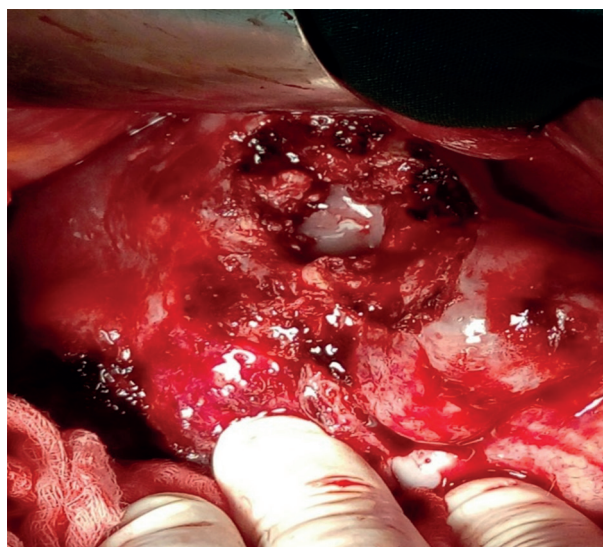


Fig. 3. Metastatic lesion with suppuration in the right lobe

## DISCUSSION

For the period 2000 - 2016 there has been a stable increase in the frequency rate of malignant diseases. The mortality rate from liver diseases, including PLA, for 2016 increased with the age: for individuals < 40 years of age it was 3.9/10 000, for those 60-70 years of age it was 40.8/10 000, for the 70-80-year group it was 82.9/10 000 and for those over 80 year of age – 197.2/10 000 (7).

PLAs usually occur in patients with diabetes and malignancy (8). Clinically, the patients present with fever, anorexia and other symptoms such as nausea, vomiting, upper right abdominal quadrant pain, pleuritic pain and jaundice. Fever is the most common symptom and is reported in 70-95% of the cases (9). In our study, fever presented in 75% of the patients, whereas the jaundice was 25%.

The most frequent deviation in the blood samples of these patients is leukocytosis, which occurs in 70-82% of the patients (9).

The values of alkaline phosphatase and transaminases may also be elevated, in some cases up to 2-3 times the upper limit of normal (9). We found leukocytosis in 50% of the patients, while transaminases were increased in 75% of the patients.

*E. coli* is the most common bacteria worldwide. For the first time, data on *K. pneumoniae* was published in Taiwan in 1900 and now exceeds *E. coli*, especially in patients with liver abscess (8,10,11).

Deguelte et al. found that in 90% of cases the imaging methods can detect liver abscess. They can also help to identify the underlying cause of the abscess. CT and colonoscopy are appropriate for detecting the etiological agent, especially when the infection is polymicrobial (1).

Law et al., in a study of 35 patients with malignant disease complicated with PLA, found that these lesions must be treated as benign abscesses by aspiration ( $\pm$  drainage) and antibiotics. They noted that aspiration did not lead to the spread of the tumor. The prognosis was unfavorable due to the oncological disease and the increased incidence of septic complications (12). In elective surgery, PLA located on the liver surface can be treated by simple fenestration and drainage, while the deep abscesses have to be treated either by intraoperative echo-directed drainage or limited hepatic resection (13,14,15).

The incidence of PLA from hematogenic (arterial) origin due to *K. pneumoniae* is increasing. This microorganism can lead to distant septic metastases. In cases of suspected superinfection of the liver metastases, percutaneous biopsy is required. Surgical treatment is considered for larger (more than 5 cm) abscesses or in concomitant colorectal cancer (1).

## CONCLUSION

1. PLA as a complication of a malignant disease has to be treated as benign abscesses by aspiration (with or without drainage) and antibiotics.
2. Surgical treatment applied in PLAs larger than 5 cm with colorectal cancer.
3. The prognosis of complicated colorectal cancer with PLA is unfavorable due to the malignant disease and increased frequency rate of septic complications.

## REFERENCES

1. Lardièrre-Deguelte S, Ragot E, Armoun K, Piardi T, Dokmak S, Bruno O, et al. Hepatic abscess: diagnosis and management. *J Visc Surg.* 2015;152(4):231–43. doi: 10.1016/j.jvisurg.2015.01.013.
2. Yu Y, Guo L, Hu C, Chen K. Spectral CT imaging in the differential diagnosis of necrotic hepatocellular carcinoma and hepatic abscess. *Clin Radiol.* 2014;69(12):e517–24. doi: 10.1016/j.crad.2014.08.018.
3. Huang CJ, Pitt HA, Lipsett PA, Osterman FA Jr, Lillemoe KD, Cameron JL, et al. Pyogenic hepatic abscess. Changing trends over 42 years. *Ann Surg.* 1996;223(5):600–7, discussion 607-9. doi: 10.1097/00000658-199605000-00016.
4. Trump DL, Fahnestock R, Cloutier CT, Dickman MD. Anaerobic liver abscess and intrahepatic metastases: A case report and review of literature. *Cancer.* 1978;41(2):682–6. doi: 10.1002/1097-0142(197802)41:2<682::AIDCNCR2820410237>3.0.CO;2-I
5. Eltawansy SA, Merchant C, Atluri P, Dwivedi S. Multi-organ failure secondary to a *Clostridium perfringens* liver abscess following a self-limited episode of acute gastroenteritis. *Am J Case Rep.* 2015;16:182–6. doi: 10.12659/AJCR.893046.
6. Kai Qu, Chang Liu, Zhi-Xin Wang, Feng Tian, Tian F, Wei JC, Tai MH, et al. Pyogenic liver abscesses associated with nonmetastatic colorectal cancers: An increasing problem in Eastern Asia.

- World J Gastroenterol. 2012;18(23):2948-55. doi: 10.3748/wjg.v18.i23.2948.
7. Yordanova E, Petkova L, Beyazov C, Karagineva E. Healthcare. 2017; NSI; ISSN 1313-1907. pp. 7 – 42.
  8. Chan KS, Chen CM, Cheng KC, Hou CC, Lin HJ, Yu WL. Pyogenic liver abscess: a retrospective analysis of 107 patients during a 3-year period. *Jpn J Infect Dis.* 2005;58(6):366–8.
  9. Lederman ER, Crum NF. Pyogenic liver abscess with a focus on *Klebsiella pneumoniae* as a primary pathogen: an emerging disease with unique clinical characteristics. *Am J Gastroenterol.* 2005;100(2):322–31. doi: 10.1111/j.1572-0241.2005.40310.x.
  10. Branum GD, Tyson GS, Branum MA, et al. Hepatic abscess. Changes in etiology, diagnosis, and management. *Ann Surg.* 1990;212(6):655–62. doi: 10.1097/00000658-199012000-00002.
  11. Wong WM, Wong BC, Hui CK, Ng M, Lai KC, Tso WK, et al. Pyogenic liver abscess: retrospective analysis of 80 cases over a 10-year period. *J Gastroenterol Hepatol.* 2002;17(9):1001–7. doi: 10.1046/j.1440-1746.2002.02787.x.
  12. Law ST, Li KK. Is hepatic neoplasm-related pyogenic liver abscess a distinct clinical entity? *World J Gastroenterol.* 2012;18(10):1110–6. doi: 10.3748/wjg.v18.i10.1110.
  13. Farges O, Vilgrain V, Belghiti J. Traitement des abcès du foie. In: EMC. Paris: Elsevier Masson SAS; 1996. pp. 40—770.
  14. Hope WW, Vrochides DV, Newcomb WL, Mayo-Smith WW, Ian-nitti DA. Optimal treatment of hepatic abscess. *Am Surg.* 2008;74(2):178—82.
  15. Tan YM, Chung AY, Chow PK, Cheow PC, Wong WK, Ooi LL, et al. An appraisal of surgical and percutaneous drainage for pyogenic liver abscesses larger than 5 cm. *Ann Surg.* 2005;241(3):485—90. doi: 10.1097/01.sla.0000154265.14006.47.