

ECTOPIC LIVER AND HEPATOCELLULAR CARCINOMA

Bakir Helić¹, Hajrudin Osmić¹, Larisa Helić²

ABSTRACT

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The most frequent anomalies of the liver are variations of the liver lobes and accessory bile ducts, and rare anomalies are related to the abnormal position of liver tissue. In this article, we present data about case reports of ectopic liver published from 2004 to 2020, about the connection between hepatocellular carcinoma and ectopic liver, its location, and the reason for a visit to a medical professional.

Keywords: ectopic liver, hepatocellular carcinoma, hcc liver

INTRODUCTION

The most frequent anomalies of the liver are variations of the liver lobes and accessory bile ducts, and rare anomalies are related to the abnormal position of liver tissue¹. Abnormal locations of liver tissue, or ectopic liver, was mentioned in an article for the first time in 1922², which described ectopic liver tissue in the inferior side of the gallbladder, 17x10x4mm in size, with its own vascular and bile ducts. The literature on the subject says that these anomalies are usually not symptomatic^{1,3}.

These anomalies can be classified in four types: (1) ectopic liver, arising outside the liver and without connection to the liver; (2) microscopic ectopic liver, which is found occasionally in the wall of the gallbladder; (3) a large accessory liver lobe attached to the liver by a stalk, (4) and a small accessory liver lobe attached to the liver⁴.

According to available data, ectopic liver is found in 0.47% patients⁵. The usual incidence of ectopic liver and accessory liver lobes is from 0.56 to 0.70%⁶.

These anomalies are hard to detect with standard imaging techniques³. Ectopic liver is usually found during abdominal surgery or autopsies⁷.

Hepatocellular carcinoma is found in 30% of ectopic liver tissue discovered⁸. It is considered that ectopic liver tissue is functionally handicapped and more susceptible to hepatocarcinogenesis because of the lack of the complete vascular and ductal structure of normal liver⁹.

Symptomatic cases can be found showing torsion, necrosis, rupture, pyloric obstruction and malignant

¹ Department of surgery, General hospital Gračanica, Gračanica, Bosnia and Herzegovina

² Department of internal medicine, General hospital Gračanica, Gračanica, Bosnia and Herzegovina

Bakir Helić,

E-mail: bakirh@gmail.com

Orcid ID: 0000-0002-5891-6164

transformation of this tissue¹⁰. The usual symptoms are pain, compression and bleeding^{11,12}.

Ectopic liver is usually found connected to the liver, close to the gallbladder, spleen, in the thoracic cavity and retroperitoneal⁶.

In this article, we present data about case reports of ectopic liver published from 2004 to 2020, about the connection between hepatocellular carcinoma and ectopic liver, its location, and the reason for a visit to a medical professional, as this clinical entity can be found during laparoscopic exploration.

Materials and methods

We searched PubMed for the term “ectopic liver”. Since we did not find any review articles on this topic published after 2004⁶, for this research we included articles presenting case reports of ectopic liver published from 2004 to the end of 2019.

We found 68 case reports in 64 articles, and from those we collected data about the location of ectopic

liver tissue, pathology findings (hepatocellular carcinoma or other pathological findings), the diagnostic technique that revealed the tissue, if it was symptomatic, and data about the age and sex of the patients.

By statistical analysis using IBM SPSS version 21.0 for Windows, we tried to find statistically significant connections within the collected data and determine the frequency of hepatocellular carcinoma in ectopic liver, connections with location, sex, age, symptoms and whether ectopic liver is symptomatic or usually an accidental finding.

Results

All case reports, except one (1.5%), included the age of the patient at the time of finding the ectopic liver. The average age was 50.12 (± 18.50) years, the youngest patient was 1, and the oldest was 91 years old (95% CI:45.61-54.63). Since we had continuous data, the Kolmogorov-Smirnov test was performed, which showed even distribution ($p=0.200$), and allowed parametric statistics.

Table 1. Location of ectopic liver

Location	Frequency	Percent	Reference
Gallbladder	15	22.1	2 5 10 13 14 15 16 17 18 19 20 21 22 23 24 ,
Spleen	9	13.2	8 11 25 26 27 28 29 30 31 , , , , , , , , , , , , , , , , , , ,
Stomach	2	2.9	32 33 , , , , , , , , , , , , , , , , , , ,
Thorax	10	14.7	4 34 35 36 37 38 39 40 41 42 , , , , , , , , , , , , , , , , , , ,
Liver	6	8.8	43 44 28 45 46 , , , , , , , , , , , , , , , , , , ,
Right atrium, inferior vena cava	10	14.7	47 48 49 50 51 52 53 54 55 56 , , , , , , , , , , , , , , , , , , ,
Pancreas	4	5.9	57 58 59 60 , , , , , , , , , , , , , , , , , , ,
Peritoneum	4	5.9	7 30 61 62 , , , , , , , , , , , , , , , , , , ,
Retroperitoneally	2	2.9	63 64 , , , , , , , , , , , , , , , , , , ,
Esophagus	1	1.5	65 , , , , , , , , , , , , , , , , , , ,
Muscles	1	1.5	66 , , , , , , , , , , , , , , , , , , ,
Small intestine	1	1.5	67 , , , , , , , , , , , , , , , , , , ,
Bile duct	2	2.9	68 69 , , , , , , , , , , , , , , , , , , ,
Skull	1	1.5	66 , , , , , , , , , , , , , , , , , , ,
Total	68	100.0	

In relation to sex, ectopic liver is more frequently found in women (61.8%) than in men (38.2%).

Ectopic liver in our data was found in 14 different locations. Most frequently this was the gallbladder (22.1%), thorax (14.7%), the right atrium and inferior vena cava (14.7%) and the spleen (13.2%). It was found in other locations in less than 10% of cases. All cases classified in terms of location are shown in Table 1.

Pathological analysis of 36 cases (52.9%) found normal liver tissue, hepatocellular carcinoma was discovered in 26 cases (38.2%), inflammation in three cases (4.4%), fibrosis in one (1.5%) and hemorrhage in two cases (2.9%) .

Table 2. Pathological findings

	Frequency	Percent
Normal	36	52.9
HCC	26	38.2
Inflammation	3	4.4
Fibrosis	1	1.5
Hemorrhage	2	2.9
Total	68	100.0

In 41 cases (60.3%), the patients had symptoms that indicated diagnostics which led to discovery of ectopic liver tissue, and for the rest of the cases the ectopic liver was found by accident.

In terms of location, the most frequently symptoms occurred if ectopic liver was located in the right atrium and the inferior vena cava (90%). Although the

Table 3.

		Location														Total
		Gallbladder	Spleen	Stomach	Thorax	Liver	Right atrium, inferior vena cava	Pancreas	Peritoneum	Retroperitoneally	Esophagus	Muscles	Small intestine	Bile duct	Skull	
Normal	Count	11	3	2	7	2	9	0	1	0	1	0	0	0	0	36
	% within Pathology	30.6%	8.3%	5.6%	19.4%	5.6%	25.0%	0.0%	2.8%	0.0%	2.8%	0.0%	0.0%	0.0%	0.0%	100.0%
	% within Location	73.3%	33.3%	100.0%	70.0%	33.3%	90.0%	0.0%	25.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	52.9%
HCC	Count	1	6	0	3	3	0	4	2	2	0	1	1	2	1	26
	% within Pathology	3.8%	23.1%	0.0%	11.5%	11.5%	0.0%	15.4%	7.7%	7.7%	0.0%	3.8%	3.8%	7.7%	3.8%	100.0%
	% within Location	6.7%	66.7%	0.0%	30.0%	50.0%	0.0%	100.0%	50.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	38.2%
Inflammation	Count	1	0	0	0	1	1	0	0	0	0	0	0	0	0	3
	% within Pathology	33.3%	0.0%	0.0%	0.0%	33.3%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	% within Location	6.7%	0.0%	0.0%	0.0%	16.7%	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.4%
Fibrosis	Count	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	% within Pathology	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	% within Location	6.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%

► Table 3.

Hemorrhage	Count	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2
	% within Pathology	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	% within Location	6.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%
Total	Count	15	9	2	10	6	10	4	4	2	1	1	1	2	1	68
	% within Pathology	22.1%	13.2%	2.9%	14.7%	8.8%	14.7%	5.9%	5.9%	2.9%	1.5%	1.5%	1.5%	2.9%	1.5%	100.0%
	% within Location	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

gallbladder is a frequent location for ectopic liver, in our data this location was rarest location for symptoms, occurring in 26.7% of cases.

Most cases were discovered by radiological techniques (49 or 72.1%), then during surgery (14 or 20.6%). In one case, diagnosis was set by a clinical exam, and in

Table 4.

			Path_HCC		Total
			Other	HCC	
Location	Gallbladder	Count	14	1	15
		% within Location	93.3%	6.7%	100.0%
		% within Path_HCC	33.3%	3.8%	22.1%
	Spleen	Count	3	6	9
		% within Location	33.3%	66.7%	100.0%
		% within Path_HCC	7.1%	23.1%	13.2%
	Stomach	Count	2	0	2
		% within Location	100.0%	0.0%	100.0%
		% within Path_HCC	4.8%	0.0%	2.9%
	Thorax	Count	7	3	10
		% within Location	70.0%	30.0%	100.0%
		% within Path_HCC	16.7%	11.5%	14.7%
	Liver	Count	3	3	6
		% within Location	50.0%	50.0%	100.0%
		% within Path_HCC	7.1%	11.5%	8.8%
	Right atrium, inferior vena cava	Count	10	0	10
		% within Location	100.0%	0.0%	100.0%
		% within Path_HCC	23.8%	0.0%	14.7%
	Pancreas	Count	0	4	4
		% within Location	0.0%	100.0%	100.0%
		% within Path_HCC	0.0%	15.4%	5.9%

► Table 4.

Location	Peritoneum	Count	2	2	4
		% within Location	50.0%	50.0%	100.0%
		% within Path_HCC	4.8%	7.7%	5.9%
	Retroperitoneally	Count	0	2	2
		% within Location	0.0%	100.0%	100.0%
		% within Path_HCC	0.0%	7.7%	2.9%
	Esophagus	Count	1	0	1
		% within Location	100.0%	0.0%	100.0%
		% within Path_HCC	2.4%	0.0%	1.5%
	Muscles	Count	0	1	1
		% within Location	0.0%	100.0%	100.0%
		% within Path_HCC	0.0%	3.8%	1.5%
	Small intestine	Count	0	1	1
		% within Location	0.0%	100.0%	100.0%
		% within Path_HCC	0.0%	3.8%	1.5%
	Bile duct	Count	0	2	2
		% within Location	0.0%	100.0%	100.0%
		% within Path_HCC	0.0%	7.7%	2.9%
	Skull	Count	0	1	1
		% within Location	0.0%	100.0%	100.0%
		% within Path_HCC	0.0%	3.8%	1.5%
Total	Count		42	26	68
	% within Location		61,8%	38.2%	100.0%
	% within Path_HCC		100,0%	100.0%	100.0%

two cases by pathological analysis. 85.71% of cases discovered by surgery were asymptomatic.

In Table 3 we show the connections between pathological findings and the locations of ectopic liver.

Since all pathological findings except hepatocellular carcinoma (HCC) were benign, we performed statistical analysis of the connection between HCC and location related to all the other findings, as shown in Table 4.

We found a statistically significant difference between the location of ectopic liver and the finding of HCC (chi-squared test: $\chi^2=36,101$, $df=13$, $p=0.001$). HCC was not found in the right atrium and inferior

vena cava (0/10), it was found in only 1/15 of cases in the gallbladder (6.7%), in 30.0% in the thorax, in 66.7% in the spleen, and all four cases in the pancreas (100%) had HCC (significantly frequent in the spleen and pancreas, and rare in the right atrium and inferior vena cava and gallbladder).

Of all cases of hepatocellular carcinoma, 26 of them, or 80.7%, were symptomatic, and benign cases were symptomatic at the rate of 47.6%.

Discussion

The data about ectopic liver in the literature are usually in the form of case reports as this anomaly is rare. The results of our search of case reports in PubMed

published from 2004 to 2020 showed that ectopic liver can be found in all age groups, from a newborn to old age. Ectopic liver is more frequent in women (61.8%). We found a relatively high incidence of ectopic liver in the right atrium and inferior vena cava (14.7%) that was not mentioned in earlier research⁶. Other frequently mentioned locations: the liver, gallbladder, spleen and thorax, were also frequent in our results. Rare locations of ectopic liver are the small bowel, muscles and skull.

Although it is said that ectopic liver is usually asymptomatic^{1,3}, in our data 60.3% of patients had some complaints that led to diagnostics and the discovery of ectopic liver as the cause of their problems. It is obvious that this tissue can cause unexpected clinical issues⁹.

Contrary to the data in the literature that ectopic liver is usually found during surgery, in our sample it was mostly found by radiology (72.1%), which can be connected the greater availability and quality of radiological diagnostics in recent years.

Hepatocellular carcinoma was found in 38.2% of our cases, which is not a significant deviation from the 30% mentioned in earlier research⁸. It is significant to mention that all cases of ectopic liver in the pancreas had hepatocellular carcinoma, and that the incidence of HCC is high in the spleen and thorax. Although ectopic liver can be frequently found in the gallbladder, where it was described for the first time, occurrence of hepatocellular carcinoma at that location is rare. Other locations of ectopic liver are rare and occurrence of hepatocellular carcinoma there is also rare.

Hepatocellular carcinoma in ectopic liver causes symptoms in 80.7% of cases, which is almost double in relation to benign cases.

Ectopic liver is usually asymptomatic if it is in the gallbladder, and asymptomatic tissue is usually found during surgery.

Conclusion

Ectopic liver is a rare phenomenon which requires surgical removal and pathological analysis because of potential malignant alterations and occurrence

of hepatocellular carcinoma. We must take this rare clinical entity into consideration during laparoscopic exploration when it can be removed before it becomes symptomatic or malignant.

Conflicts of interest

The authors have no conflict of interest.

Literature

1. Sadler TW, Langman J, Leland J, et al. Langman's Medical Embryology. 9th edition. Lippincott Williams & Wilkins; 2004.
2. Martinez CAR, De Resende HC, Rodrigues MR, Sato DT, Brunialti CV, Palma RT. Gallbladder-associated ectopic liver: A rare finding during a laparoscopic cholecystectomy. *Int J Surg Case Rep.* 2013;4:312-315. doi:10.1016/j.ijscr.2013.01.006
3. Sato S, Watanabe M, Nagasawa S, Niigaki M, Sakai S, Akagi S. Laparoscopic observations of congenital anomalies of the liver. *Gastrointest Endosc.* 1998;47:136-140. doi:10.1016/S0016-5107(98)70345-1
4. Lee JY, Kim KH, Kang MS, Kim KH. Ectopic hepatocellular carcinoma arising from the peritoneum in a patient with a history of oropharyngeal cancer: A case report. *Case Rep Oncol.* 2015;8:456-460. doi:10.1159/000441020
5. Jaboury IA. Ectopic liver, choristoma and hepar succenturiatum. *ANZ J Surg.* 2016;86:524-525. doi:10.1111/ans.13455
6. Caygill CPJ, Gatenby PAC. Ectopic liver and hepatocarcinogenesis. *Eur J Gastroenterol Hepatol.* 2004;16:727-729. doi:10.1097/01.meg.0000131037.92864.df
7. Elsayes HB, Elzein MA, Razik AMA, Olude IO. Torsion of an ectopic liver in a young child. *J Pediatr Surg.* 2005;40. doi:10.1016/j.jpedsurg.2004.11.009
8. Dettmer M, Itin P, Miny P, Gandhi M, Cathomas G, Willi N. Giant ectopic liver, hepatocellular carcinoma and pachydermia-a rare genetic syndrome? *Diagn Pathol.* 2011;6:75. doi:10.1186/1746-1596-6-75

9. Arakawa M, Kimura Y, Sakata K, Kubo Y, Fukushima T, Okuda K. Propensity of ectopic liver to hepatocarcinogenesis: Case reports and a review of the literature. *Hepatology*. 1999;29:57-61. doi:10.1002/hep.510290144
10. Pandit N, Sah R, Lacoul R. Ectopic Liver Tissue on the Gallbladder: a Rare Incidental Finding. *Indian J Surg*. 2019;81:94-95. doi:10.1007/s12262-018-1826-0
11. Matsuyama M, Sugiura S, Kakita A, Sato Y, Kuroda M. Hepatocellular carcinoma arising from ectopic liver tissue in the spleen producing insulin-like growth factor II. *Pathol Res Pract*. 2011;207:124-126. doi:10.1016/j.prp.2010.09.003
12. Nagar S, Koffron A, Raofi V. A case of hemorrhagic necrosis of ectopic liver tissue within the gallbladder wall. *HPB Surg*. 2011;2011:3-5. doi:10.1155/2011/389381
13. Koh CE, Hunt R. Ectopic liver encountered during laparoscopic cholecystectomy. *Asian J Surg*. 2007;30:227-229. doi:10.1016/S1015-9584(08)60028-7
14. Karaca G, Özden H, Pehlivanlı F, Pekcici MR, Yıldırım Y. Ectopic Liver Tissue on the Gallbladder: An Incidental Mass in Laparoscopy. *Arch Iran Med*. 2016;19:78-79.
15. Triantafyllidis I, Papapavlou L, Nikoloudis N, et al. Ectopic liver tissue attached to the gallbladder wall: A case report. *Cases J*. 2009;2:1-5. doi:10.1186/1757-1626-2-6786
16. Bal A, Yilmaz S, Yavas BD, et al. A rare condition: Ectopic liver tissue with its unique blood supply encountered during laparoscopic cholecystectomy. *Int J Surg Case Rep*. 2015;9:47-50. doi:10.1016/j.ijscr.2015.02.027
17. Segura-Sanchez J, Torres-Dominguez Y, Ruiz-Garcia E. Letters to the Editor. *Rev Esp Enferm Dig*. 2014;106:149-150. doi:10.10108/2014/106/2/149-150
18. Dettmer M, Cathomas G, Willi N. Alpha 1-antitrypsin retention in an ectopic liver. *Diagn Pathol*. 2011;6:1-4. doi:10.1186/1746-1596-6-16
19. Nagar S, Koffron A, Raofi V. A case of hemorrhagic necrosis of ectopic liver tissue within the gallbladder wall. *HPB Surg*. 2011;2011:3-6. doi:10.1155/2011/389381
20. Ikeda H, Suzuki M, Takahashi H, et al. Hepatocellular carcinoma with silent and cirrhotic non-alcoholic steatohepatitis, accompanying ectopic liver tissue attached to gallbladder. *Pathol Int*. 2006;56:40-45. doi:10.1111/j.1440-1827.2006.01916.x
21. Lundy J, Johnson E, Edwards K, Rivera D. Laparoscopic management of gallbladder-associated ectopic liver. *JLS*. 2005;9:485-487.
22. Karaman K, Teke Z, Ercan M, Keklik TT, Bostanci EB, Akoglu M. Ectopic liver (choristoma) attached to the gallbladder wall. *ANZ J Surg*. 2012;82:948. doi:10.1111/ans.12006
23. Burke EP, Harkins P, Arih I, O'Donoghue G. A case of ectopic liver tissue adherent to the gallbladder. *J Surg Case Reports*. 2018;2018:1-3. doi:10.1093/jscr/rjy128
24. Arslan Y. Rare entity: Ectopic liver tissue in the wall of the gallbladder - A case report. *World J Clin Cases*. 2014;2:924. doi:10.12998/wjcc.v2.i12.924
25. Díez MJ, Canela T, Villas A, Gil M. Contribución de la gammagrafía hepatobiliar con 99mTc-mebrofenina al diagnóstico del hígado ectópico. A propósito de un caso. *Rev Esp Med Nucl*. 2009;28:125-127. doi:10.1016/S0212-6982(09)71355-2
26. Del Sordo R, Bellezza G, Colella R, Mameli MG, Giansanti M, Cavaliere A. Epithelial cyst of the spleen with foci of ectopic liver. *J Pediatr Surg*. 2011;46:e21-e23. doi:10.1016/j.jpedsurg.2010.09.008
27. Jin R, Yu Q, Liang X. Ectopic hepatocellular carcinoma manifesting multiple abdominal masses. *Med (United States)*. 2017;96:1-5. doi:10.1097/MD.00000000000008968
28. Leone N, Saettone S, De Paolis P, et al. Ectopic livers and related pathology: Report of three cases of benign lesions. *Dig Dis Sci*. 2005;50:1818-1822. doi:10.1007/s10620-005-2944-7
29. Liu KL, Ho MC, Chen PJ. Ectopic liver with hepatocellular carcinoma in the peritoneum. *AJR*

- Am J Roentgenol. 2007;188:206-207. doi:10.2214/AJR.06.0694
30. Zonca P, Martinek L, Ihnat P, Fleege J. Ectopic liver: Different manifestations, one solution. World J Gastroenterol. 2013;19:6485-6489. doi:10.3748/wjg.v19.i38.6485
31. Oldani A, Garavoglia M. Hepatocellular cancer arising from ectopic liver tissue on diaphragm. Case report. Ann Ital Chir. 2014;85.
32. Barazza G, Adler DG, Factor RE. An unexpected diagnosis of ectopic liver diagnosed by fine needle aspiration. Cytojournal. 2016;13:29. doi:10.4103/1742-6413.196239
33. Huang W, Xu X, Li T, Zhang H, Chen Y, Li S. Ectopic liver tissue in stomach paries: A case report. Int J Clin Exp Pathol. 2015;8:11704-11707.
34. Adin ME, Çetinçakmak MG, Deniz MA, Göya C. Accessory liver within the thoracic cavity. Surg Radiol Anat. 2018;40:1085-1091. doi:10.1007/s00276-018-2046-9
35. Huang CS, Hsu WH, Hsia CY. Supradiaphragmatic ectopic liver: Delayed traumatic hepatic hernia mimics pulmonary tumor. Thorac Cardiovasc Surg. 2007;55:277-278. doi:10.1055/s-2006-924624
36. Huang TW, Chan DC, Lee HS, Yao NS, Lee SC, Cheng YL. Ectopic hepatocellular carcinoma of the diaphragm. Dig Dis Sci. 2007;52:1118-1120. doi:10.1007/s10620-006-9329-4
37. Lee EJ, Lee SY, In KH, Park S, Kim HS. Inadvertently found thoracic ectopic liver confirmed without surgery. Respiration. 2011;81:343-344. doi:10.1159/000322412
38. Nishikawa K, Watanabe K, Hisamatsu Y, Shiao K. Ectopic Hepatocellular Carcinoma of the Left Sub-diaphragm with Metastasis. Intern Med. 2011;50:1505-1506. doi:10.2169/internalmedicine.50.5499
39. Rozen E, Stephens G, Asarian A, Xiao P. Ectopic Hepatic Tissue Presented as a Posterior Mediastinal Mass. ISRN Gastroenterol. 2011;2011:1-3. doi:10.5402/2011/120690
40. Rodríguez Gómez CM, Baldó Padró X, Rubio Garay M. Ectopic Intrathoracic Liver Tissue. Arch Bronconeumol. 2018;54:429. doi:10.1016/j.arbres.2017.10.012
41. Song Z, Chen G, Xu X, Chen J, Zhou Q. Pleural ectopic hepatic tissues mimicking intrapleural dissemination of tumour. ANZ J Surg. 2011;81:756-757. doi:10.1111/j.1445-2197.2011.05859.x
42. Tancredi A, Cuttitta A, De Martino DG, Scaramuzzi R. Ectopic hepatic tissue misdiagnosed as a tumor of lung. Updates Surg. 2010;62:121-123. doi:10.1007/s13304-010-0016-9
43. Algin C, Yaylak F, Gurlek Olgun E, Caglikulekci M. Laparoscopic Removal of an Incidental Ectopic Liver: Short Report of a Case. Case Rep Gastroenterol. 2008;2:134-137. doi:10.1159/000121283
44. Horn F, Kubikova E, Dubravova D, et al. Omphalocele with ectopic liver forming a mesodermal cyst. Bratislava Med J. 2013;114(02):100-103. doi:10.4149/BLL_2013_023
45. Seo UH, Lee HJ, Ryu WS, et al. Laparoscopic resection of a hepatocellular carcinoma arising from an ectopic liver. Surg Laparosc Endosc Percutaneous Tech. 2008;18:508-510. doi:10.1097/SLE.0b013e31817e920f
46. Nakamura N, Irie T, Tanaka S, Arai S. A case of ectopic hepatocellular carcinoma with peritoneal dissemination. Nihon Shokakibyo Gakkai Zasshi. 2013;11:1968-1975.
47. Altay CM, Hacifazlioglu C, Topcuoglu OM, Kul M, Uysal Ramadan S. Misdiagnosed epigastric mass: Ectopic liver. J Magn Reson Imaging. 2017;45:761-763. doi:10.1002/jmri.25449
48. Soliman M, Akanbi O, Salem A, Khreis M, Abdel-Latif A. Ectopic Liver Tissue Mistakenly Diagnosed as a Right Atrial Myxoma. Cureus. 2019;11:8-13. doi:10.7759/cureus.3862
49. Doshi A, Shah D, Gupta S, et al. A Rare Case of an Ectopic Liver Presenting as Right Atrial Mass. Case Reports Cardiol. 2019;2019:1-4. doi:10.1155/2019/4103827
50. Giritharan S, Salhiyyah K, Tsang G. Surgical excision of ectopic hepatic tissue in the right atrium. J Thorac Cardiovasc Surg. 2018;155:e47-e48. doi:10.1016/j.jtcvs.2017.07.080

51. Izzo BA, Stoudenmire CJ, Byrd BF. Ectopic Liver Tissue Presenting as a Right Atrial Mass on Echocardiography. *Case.* 2017;1:212-215. doi:10.1016/j.case.2017.05.007
52. Moody WE, Hübscher SG, Rooney SJ, Doshi SN. Intracardiac ectopic liver mimicking atrial myxoma - An unusual cause for a right atrial mass. *Int J Cardiol.* 2016;209:210-212. doi:10.1016/j.ijcard. 2016.02.055
53. Morris MW, Helling TS, Creswell LL, Jordan B, Mitchell ME. Ectopic liver masquerading as a floating intracaval mass. *J Vasc Surg.* 2012;55:1759-1761. doi:10.1016/j.jvs.2011.12.064
54. Rafiei P, Sebastian S, Patel RB, Roda MS. Ectopic intracaval liver. *Clin Imaging.* 2012;36:869-872. doi:10.1016/j.clinimag.2012.01.005
55. Trocciola SM, Balsam LB, Yee H, Gianos E, Srichai MB, Deanda A. Ectopic liver: An unexpected finding in a right atrial mass. *Ann Thorac Surg.* 2011;92:715-718. doi:10.1016/j.athoracsurg. 2011.01.100
56. Xu L, Jeudy J, Burke AP. Ectopic hepatic tissue presenting as right atrial mass. *Hum Pathol.* 2012;43:958-960. doi:10.1016/j.humpath.2011. 10.004
57. Braun M, Kuncman W, Teresiński L, Kupnicki P, Jesionek-Kupnicka D, Kordek R. Pure hepatocellular carcinoma originates from an ectopic liver nodule located in the pancreas. *Współczesna Onkol.* 2017;21:311-314. doi:10.5114/wo.2017.72403
58. Cardona D, Grobmyer S, Crawford JM, Liu C. Hepatocellular carcinoma arising from ectopic liver tissue in the pancreas. *Virchows Arch.* 2007;450:225-229. doi:10.1007/s00428-006-0353-8
59. Li Z, Wu X, Wen T, Li C, Peng W. Multiple ectopic hepatocellular carcinomas in the pancreas: A case report. *Med (United States).* 2017;96:1-5. doi:10.1097/MD.00000000000006747
60. Kubota K, Kita J, Rokkaku K, et al. Ectopic hepatocellular carcinoma arising from pancreas: A case report and review of the literature. *World J Gastroenterol.* 2007;13:4270-4273. doi:10.3748/wjg.v13.i31.4270
61. Kanzaki R, Yamada T, Gotoh K, Takahashi H, Ohigashi H, Ishikawa O. Ectopic hepatocellular carcinoma arising in the left triangular ligament of the liver. *Case Rep Gastroenterol.* 2010;4:138-143. doi:10.1159/000314042
62. Miyake T, Hoshino S, Yoshida Y, et al. Multiple ectopic hepatocellular carcinomas arising in the abdominal cavity. *Case Rep Gastroenterol.* 2012;6:629-634. doi:10.1159/000343433
63. Yuce S, Sahin OZ, Bedir R, Ayaz T, Durakoglugil T. A case report of retroperitoneal extrahepatic hepatocellular carcinoma presented with elevated level of Alpha fetoprotein. *Hippokratia.* 2014;18:80-82.
64. Singh V, Sinha RJ, Sankhwar SN, et al. Primary hepatocellular carcinoma in ectopic liver masquerading as left adrenal carcinoma: a rare occurrence. *Rare Tumors.* 2010;2:97-98. doi:10.4081/rt.2010.e35
65. Zhang ZL, Wang JL, Guo CL, et al. Ectopic liver tissue in the esophagus: A case report. *Medicine (Baltimore).* 2019;98:e15260. doi:10.1097/MD.00000000000015260
66. Nenekidis I, Anagnostakou V, Paralikas I, Kokkori A, Dedeilias P, Zisis C. Ectopic hepatocellular carcinomas developed in the chest wall and skull. *Asian Cardiovasc Thorac Ann.* 2011;19:360-362. doi:10.1177/0218492311419460
67. Shigemori M, Kondo M, Azechi H, et al. A case of ectopic hepatocellular carcinoma in the jejunum. *J Gastroenterol.* 2006;41:913-918. doi:10.1007/s00535-006-1872-4
68. Tsushimi T, Enoki T, Harada E, et al. Ectopic hepatocellular carcinoma arising in the bile duct. *J Hepatobiliary Pancreat Surg.* 2005;12:266-268. doi:10.1007/s00534-004-0963-y
69. He M, Wang H, Ji F, Li K, Chen T, Wang J. Diagnosis and Therapy of Ectopic Hepatocellular Carcinoma Growing in the Intrahepatic Bile Duct. *J Coll Physicians Surg Pak.* 2016;11:130-132.