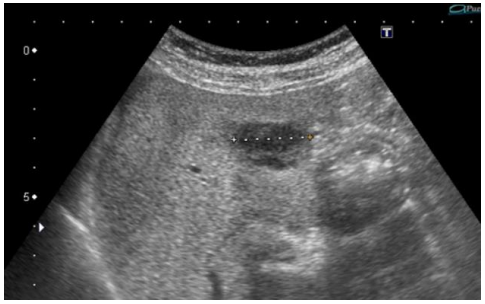
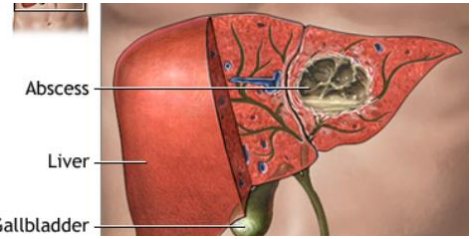
國病之一



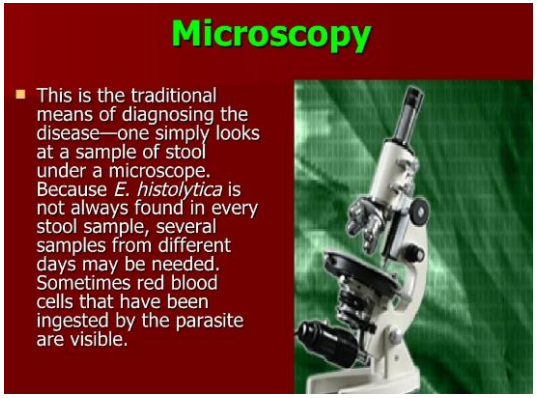


消化系課程 PGY, NP, DM, CME 1 hr.

肝膽胰常見疾病-國病之一:
肝膿瘍之診斷及治療(2025)
Pyogenic Liver Abscess

Cheng-Yi WANG

2025.06.06.



IHA for amebiasis

國病知多少?

健保燒錢排行榜TOP 10

01	慢性腎病
02	糖尿病
03	齒齦炎及牙周疾病
04	齲齒
05	高血壓
06	門診癌症治療
07	呼吸衰竭
08	慢性缺血性心臟病
09	思覺失調症
10	急性上呼吸道感染

資料來源：衛生福利部中央健康保險署

2019年10大燒錢疾病

疾病別名稱	醫療費用	就醫人數	平均每人就醫費用
1.慢性腎臟疾病	533.16億元	39.7萬人	13萬4157元
2.第二型糖尿病	309.60億元	153.6萬人	2萬150元
3.齒齦炎及牙周疾病	180.03億元	906.1萬人	1987元
4.齲齒	166.46億元	577.9萬人	2880元
5.本態性(原發性)高血壓	140.27億元	179.2萬人	7829元
6.來院接受抗腫瘤治療（註2）	134.05億元	7.7萬人	17萬3783元
7.呼吸衰竭	125.16億元	4.1萬人	30萬2361元
8.慢性缺血性心臟病	122.66億元	38.2萬人	3萬2083元
9.思覺失調症	115.09億元	10.6萬人	10萬8473元
10.支氣管及肺惡性腫瘤	110.12億元	6萬人	18萬3000元

註1：費用以健保點值1點1元計算
註2：各種癌症治療，比如放、化療或免疫療法、緩和照護等，不包括肺癌檢查

資料來源：健保署　整理：林周義

「台灣之光」！國人最花錢的十大疾病統計出爐，根據健保署最新統計，2015年慢性腎臟衰竭患者共花掉健保近470億元，再度蟬聯「國病」榜首，平均每名患者花費逾18萬元，洗腎人數也首度突破8萬關卡；榜眼是牙科相關疾病，一年「吃」掉健保逾395億元，而糖尿病相關疾病則摘下探花，一年也花掉256億多元。

國病知多少?

- **國病**之定義:1.國人常見的病.
- 2. 令人引以為憂,
- 3.要很重視,一定會診斷及治療
- 4.研究也要很多,超過各國

「國病」大腸直腸癌 連10年癌症榜首(2018)

- --First Colonoscopy screening (1987-)-→virtual colonography

台灣「國病」—病毒性肝炎、肝癌！儘早追蹤，家族病史尤勿輕忽

107年

發生數序位	原發部位	個案數	標準化發生率	年齡中位數	標準化死亡率	個案數
1	大腸	16,525	41.8	66	14	16,408
2	肺、支氣管及氣管	15,345	38.8	66	22.8	14,282
3	女性乳房	14,217	78.9*1	56	12.5*1	13,965
4	肝及肝內膽管	11,342	28.6	66	20.3	11,225
5	口腔、口咽及下咽	8,170	22.5	57	8.1	7,797
6	攝護腺	6,644	34.7*2	72	6.6*2	5,866
7	甲狀腺	4,445	14.3	50	0.5	4,053
8	皮膚	4,049	9.6	75	0.7	3,804
9	胃	3,798	9.3	68	5.5	3,703
10	子宮體癌	2,787	15.5*1	55	2.0*1	2,695
	全癌症	116,131	309.8	63	121.8	111,684

台灣快跟「國病」說bye bye了！ B肝帶原跌破2百萬大關 <----------→ Hepatitis B vaccination Universal (1986)

HBsAg carrier 由 350 萬變171 萬人、國病之名要被取消了(2018.06)

@Liver abscess

@ Lung cancer

→I新國病

Lung cancer升第一名

- 政府(中央政府)有責任. 指中火「火力全開」引發空污疑慮
- 廢棄核能發電, 專注火力發電, 增加空氣污染.
- 臺中市長很有魄力, 為國民健康提出反對意見

台中市長 **盧秀燕** 今天（22日）出席行政院會，呼籲中央妥善規劃能源調度，不要以市民健康換取供電穩定。 盧秀燕並以興達電廠為例，操作許可證到期卻重啟運轉，難怪中部民眾強烈要求中火燃煤機組屆期，應「拆除」，而非「除役」，才能防止偷燒。 盧秀燕指出，台中火力發電廠是全國最大的燃煤發電廠，長期扮演重要電力供應角色。市府持續關注空氣品質與發電調度情形，近期發現中火九部燃煤機組有全面啟用、火力全開的狀況。

中火「火力全開」引發空污疑慮 盧秀燕籲：勿以市民健康換取供電 ...

tw.news.yahoo.com/%E4%B8%AD%E7%81%AB-%E7%81%AB%E5%8A%9B%E5%...

2025.05.22

臺灣十大癌症

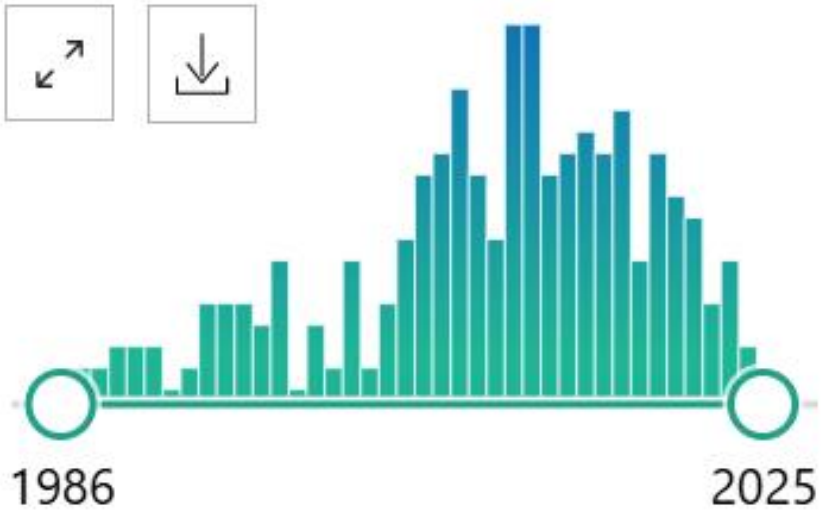
- 肺癌是目前全球癌症死因第一位。而在臺灣，肺癌更是自2004年起，持續高居國人癌症死因首位；依據最新公布的2021年數據統計顯示，年度肺癌死亡人數再創新高，已突破萬人大關。更令人心驚的是，肺癌同時也是「晚期發現率」及「醫療支出」皆為最高的癌症，嚴重威脅國人健康，因而被稱為「臺灣新國病」。

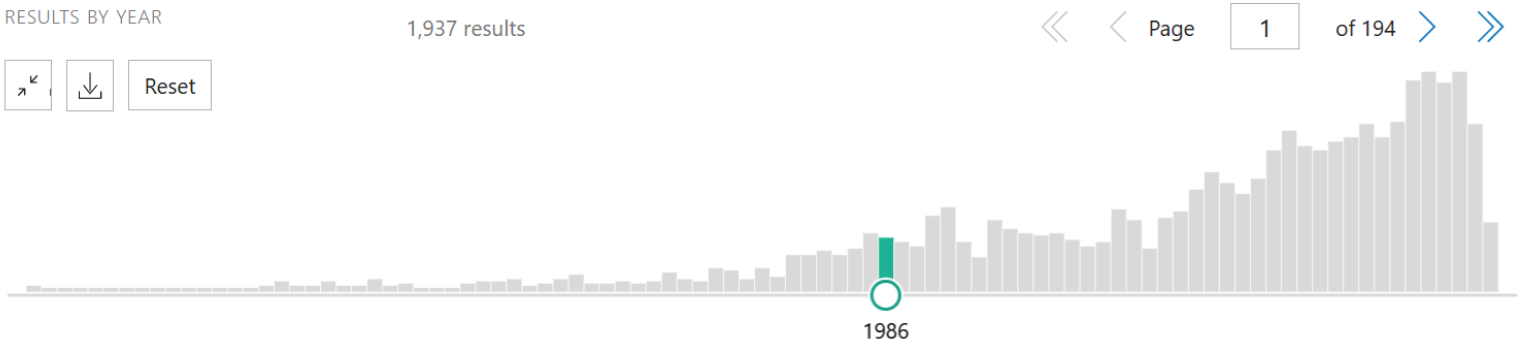
男性
肺癌44.7到45.8
大腸癌48.6 到49

女性
肺癌：34.6 增加到38.5
大腸癌33.3增加到33.5
乳癌82.6 增加到92.0

先天遺傳、環境及女性荷爾蒙等多種因素交互作用結果

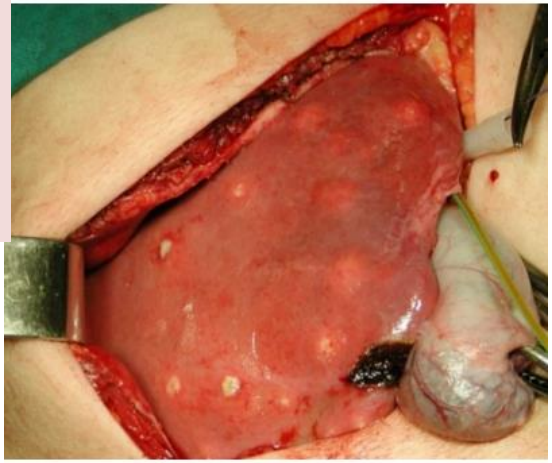
PLA : 218 (1986-2025, in Taiwan)
1937 (Global)(1931-2025)

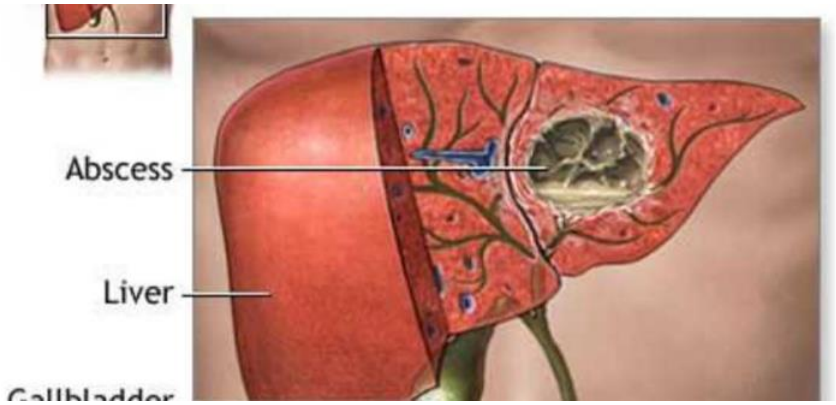




I. Liver abscess: 2類

1. **Pyogenic liver abscess**
   is a pus-filled area in the liver.



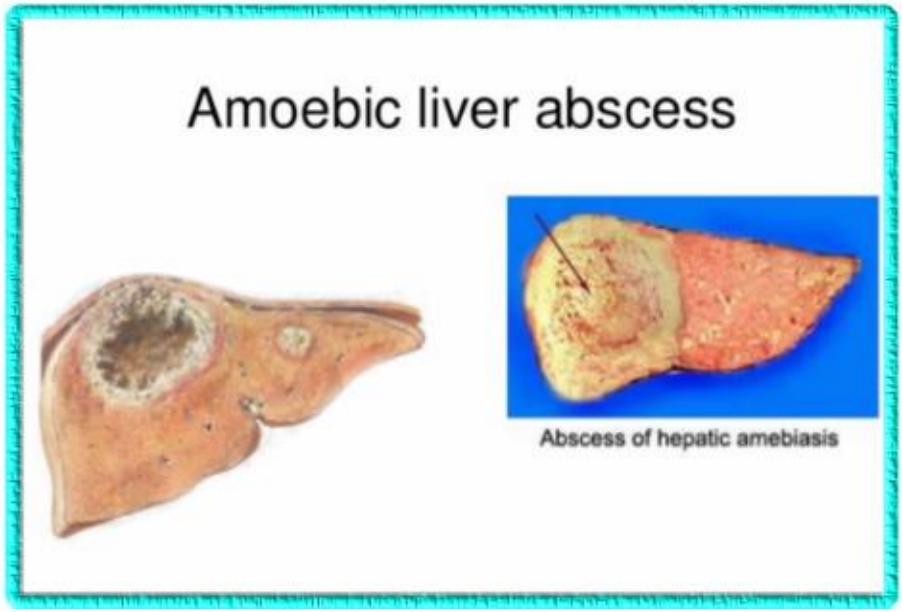


2. Amebic liver abscess

@多. 很特別、研究報告也不少

Liver abscess-2
原因不同、治療方法也不同

- **2. Amebic liver abscess**



IHA is often diagnostic.

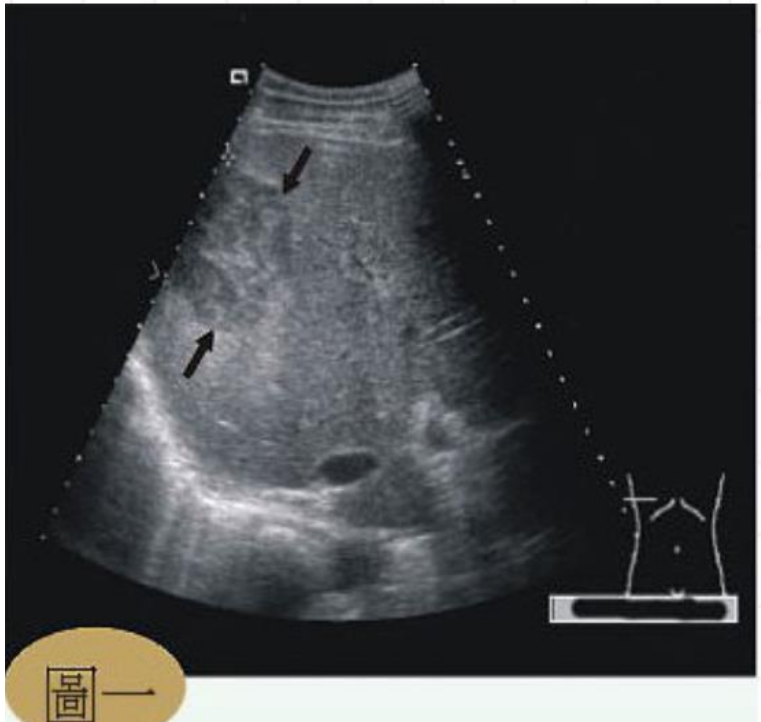
Amoebic liver abscess is a type of liver abscess caused by amebiasis. It is the involvement of liver tissue by trophozoites of the organism ***Entamoeba histolytica*** and of its abscess due to necrosis

形成肝膿瘍有兩個先決條件

- 形成肝膿瘍有兩個先決條件，
- **一是病人本身的免疫系統功能低下，致使肝臟易受病原菌的攻擊；**
- **二是病人體內某處有感染，且不斷將細菌送出，**
- 再透過各種管道到達肝臟實質內增殖。正常人(免疫系統健全的人)的肝臟內部是呈現無菌狀態，因為它具有防禦細胞，可將進入的病原菌過濾並消滅之。但是，病人如果因為年紀大，或是患有會使免疫功能低下的疾病(如：糖尿病、AIDS等)時，將會使肝臟的防禦功能降低，而使肝臟曝露於易受攻擊的狀態。
- 在另一方面，要瞭解病原菌如何進入肝內，須從解剖上去說明。肝臟位於腹腔內的右上部，它接受兩套血液供應，一個是肝門靜脈，另一個是肝動脈。肝門靜脈主要接受來自大小腸的靜脈迴流血，所以當大小腸某處有發炎時(如：急性盲腸炎或憩室炎)，**病原菌會經由肝門靜脈進入肝內。而肝動脈的血液主要來自主動脈，所以病人如果有某些疾病(如：肺炎、心內膜炎)嚴重到形成敗血症時，細菌會經由肝動脈到達肝內。**
- 肝臟是人體內最大的代謝器官，代謝後會形成膽汁。這些膽汁會經由膽管系統運送到十二指腸內，來幫助脂肪消化。如果膽管因為結石或腫瘤有膽汁滯留的情形時，來自腸內的細菌會在這些膽汁內增殖，而造成膽管炎。膽管炎一旦形成，細菌將會進一步沿著膽管而上進入肝內。從以上的說明，我們可以了解到，**病原菌主要經由肝門靜脈、肝動脈及膽管系統進入肝內，而造成肝膿瘍。**

案例1,(DM+fever+malaise)

王先生、男性45歲，有糖尿病病史已經5年，因持續發燒不退、倦怠、食慾不振，而至急診掛號，在急診時一直有冷顫、忽冷忽熱之情形，經急診醫師檢視，王先生有輕微黃疸、腹脹情況，抽血檢查發現白血球與發炎指數異常上升，且有肝功能異常情形，經肝臟超音波檢視後發現肝臟右葉有一顆低迴音腫瘤大小約6公分，經電腦斷層檢查確定為肝膿瘍。王先生住院後，接受經皮穿肝引流術，把肝膿瘍內之膿液引流出來，並針對膿液做細菌培養，經過2個禮拜治療後康復出院，並於門診做持續追蹤。



圖一

圖二

Symptoms

- 患有肝膿瘍的病人，初始的臨床症狀可能僅是腹部不適，而後期最常見的是**發冷 和發熱。**發燒時，體溫可能高達39℃至40℃。其它常見的症狀，還包括心窩部或右上腹部疼 痛。如果病人合併膽道方面的疾病時，黃膽的症狀也會發生，例如：眼白或全身泛黃、灰白便及茶色尿。我們的經驗顯示，病人有不明原因的發冷及發熱時，起初都不以為意，可能就近求 醫或者自行拿藥吃，再加上這些病人常合併一些使免疫機能低下的疾病(糖尿病最常見)，病程發展的速度將加快，所以當病人被送至大醫院時，敗血症通常已經發生而有生命危險的情 形，不可不慎。
- **腹部超音波**是診斷肝膿瘍最便利且無侵犯性的檢查工具。近年來，由於科技發展迅速，腹部超音波已遍及所有的醫療院所，因此當病人有不明原因的發冷發熱，心窩部或右上腹部疼痛，尤其合併有黃疸時，應立即接受腹部超音波檢查，以及早發現肝膿瘍。此外，腹部電腦斷層也是一項很好的檢查工具，它可提供更進步的資料，以利診斷的確立及治療計畫的選擇。

Goal of Treatment and outcome

- 肝膿瘍如果沒有適當的治療，其死亡率相當高，敗血症是主要的死亡原因。
- 治療目標有二：第一是肝膿瘍本身的治療；第二是消除感染源。在肝膿瘍本身的治療方面，**抗生素的給予及適當的引流是必須的。原則上，當診斷確立後，應先給予廣效性的抗生素，如果病況允許，經皮穿肝膿瘍引流術也要同時或儘早進行。**臨床經驗告訴我們，**有效地引流**可縮短且改善病情，它有兩點好處。第一是可將膿瘍內的膿汁立即引流出體外；第二是可將這些發炎的物質送去作培養，再針對這些培養出的細菌給予有效的抗生素，所以不容忽視它在治療上的地位。至於消除感染源方面，為了避免復發，試圖找出體內有否其它發炎的疾病並治療之，也是非常的重要。
- 總之，**自身免疫系統不好的病人(如：年老或糖尿病)，若有不明原因發冷發熱時，尤其有腹部不適之症狀時，應儘速接受腹部超音波檢查，早期發現，早期治療。**

Case 2,糖尿病,沒有接受 血糖控制治療。

- 病例 ：林先生，三十九歲，大卡車司機。住院 十天前開始感到全身無力及胃口不佳，雖至附近醫院求診，但症狀未獲改善。一個星期後，斷斷續續有發冷發熱的情形發生。發燒時，體溫最高到攝氏三十九度。此外，林先生同時有腹脹、茶色尿及右胸呼吸不適等症狀 。於是，他來到本院急診求治，接受腹部超音波及電腦斷層檢查，證實在肝臟右葉有一個直徑約五公分的肝膿瘍。追溯過去病史，發現在七年前林先生就已經有糖尿病，但是他都沒有接受血糖控制治療。

嚴重的合併症-→破入心包膜腔

ELSEVIER

American Heart Journal

Volume 33, Issue 3, March 1947, Pages 375-384

AHJ

Clinical report

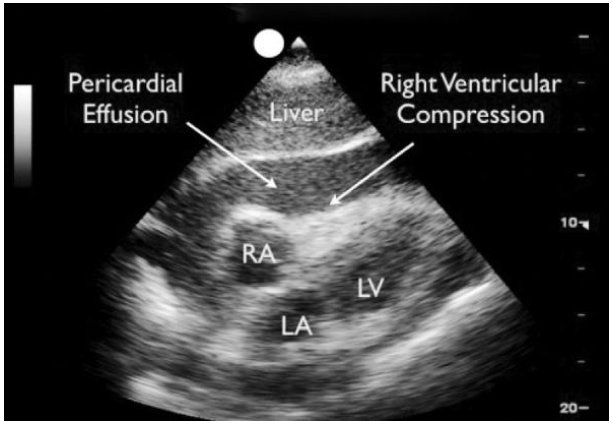
Multiple liver abscesses with rupture into the pericardium

Major Rudolph Zodikoff (Medical Corps, Army of the United States)

ASF Regional Hospital, Fort Jackson, S. C. USA

1947

1. **A case of multiple pyogenic liver abscess with complicating sudden rupture into the pericardial sac is presented.**
2. The source of the liver abscess was not found at necropsy.
3. Penicillin, 19,050,000 units, plus supportive therapy over an eight-week period, held the infection in abeyance but did not overcome it. The responsible organism was penicillin sensitive as judged by the clinical response.
4. Typical electrocardiographic changes of acute pericarditis were demonstrated in the limb leads, with minimal findings in the chest leads



Pericardial tamponade due to ruptured pyogenic hepatic abscess

November 2007 Br J Cardiol 2007;14:296 Leave a comment

Click any image to enlarge

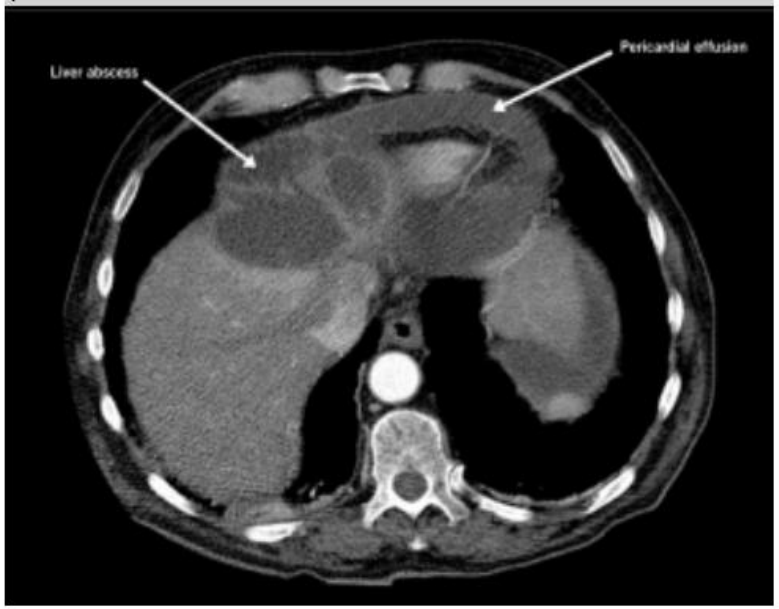
Authors: Sushma Rekhraj, Trevor Wistow Show details

This case describes the unfortunate consequence of hepatic abscess, initially discovered following abnormal liver function tests.

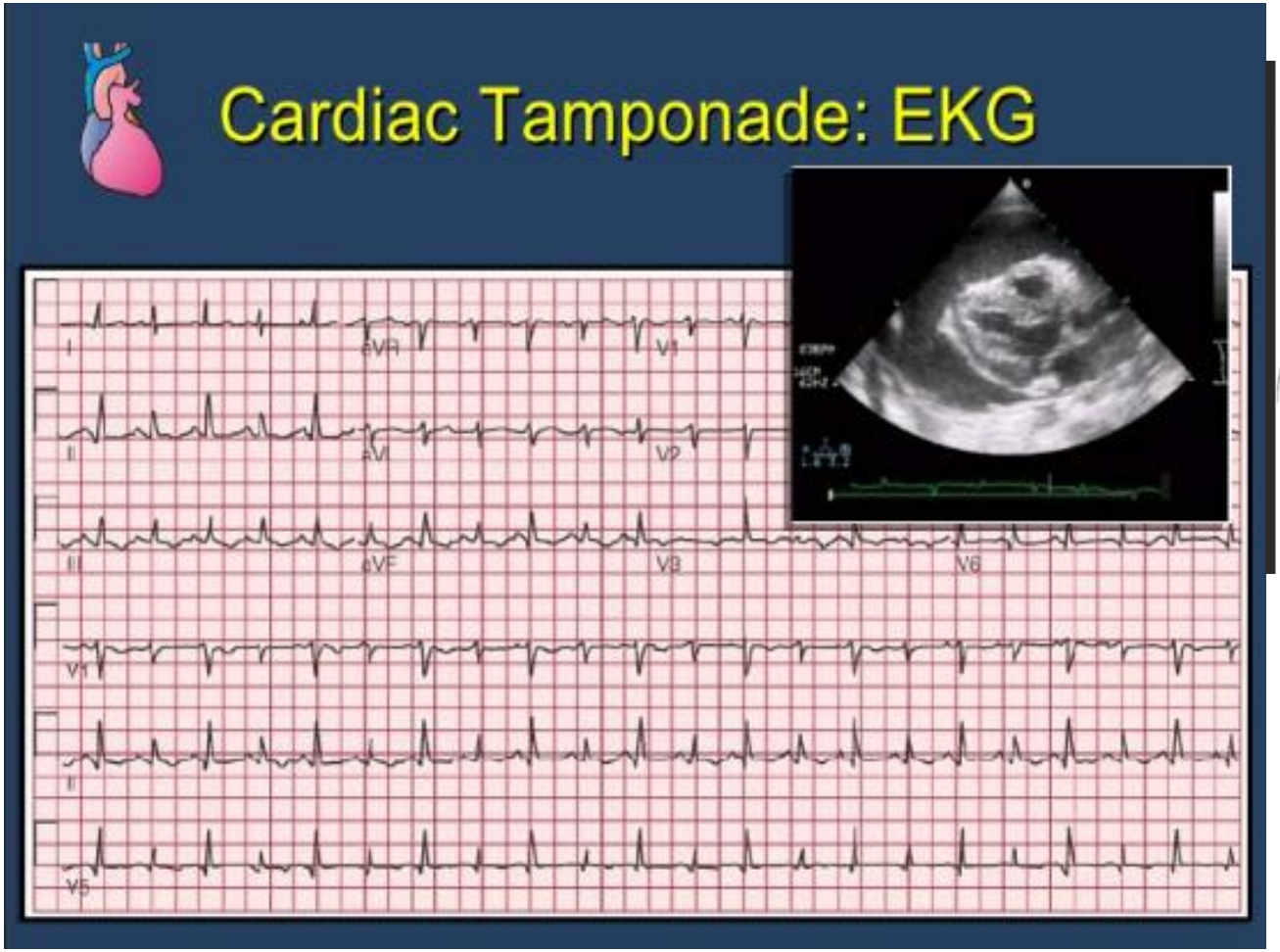
Case report

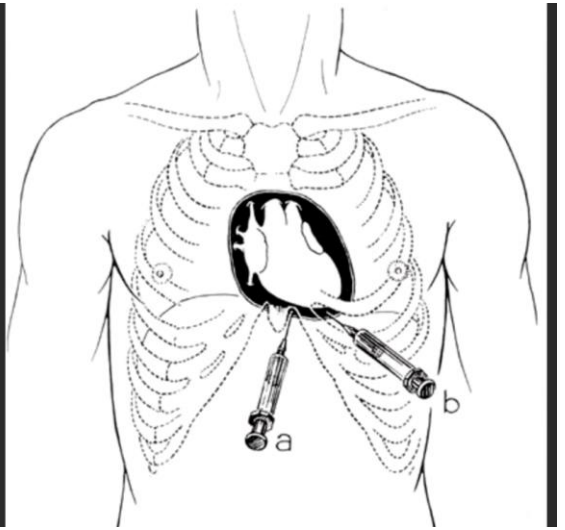
A 76-year-old diabetic male presented with a three-day history of central chest pain and breathlessness. Liver ultrasound performed two months previously due to abnormal liver function tests had shown two cysts but no action was taken. On examination, he looked unwell with a raised venous pressure. Computed tomography (CT) scan showed a 2 cm pericardial effusion and a large multi-locular cyst 12 cm x 9 cm arising from the left lobe of the liver and extending to the base of the heart (**figure 1**).

Figure 1. Computed tomography (CT) scan showing the hepatic abscess and pericardial effusion

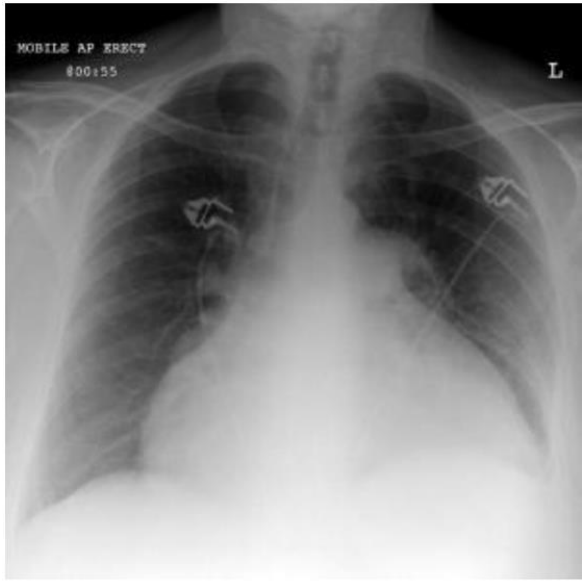


Cardiac Tamponade: EKG





EKG Sinus tachycardia
Low voltage QRS (≤5mm in the 6 limb leads)
Electrical alternans



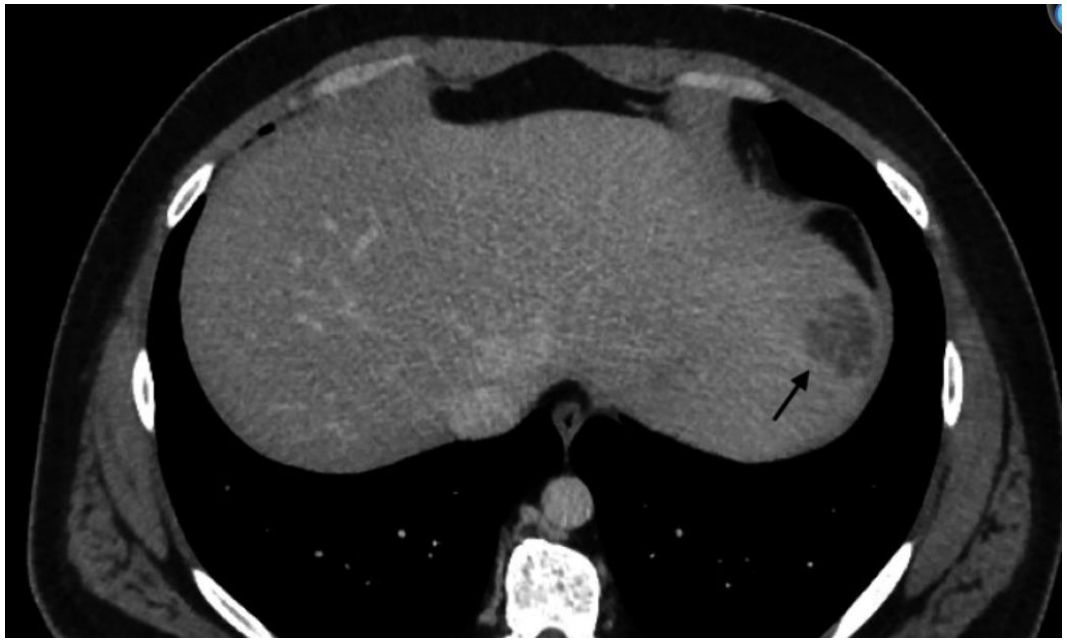
Radiopaedia

- 一名36歲的男性患者就是這種情況，他是一名飛行員，沒有既往病史，不吸煙，偶爾飲酒。他最近從德國旅行回來后，因嘔吐、腹瀉、**持續高熱（高達 40°C）**、輕度乾咳和全身乏力而到急診科就診。他提到了旅途中在瑞典的 24 小時中途停留。

- 在急診科，檢查顯示左下葉浸潤，他的血液檢查顯示輕度低鈉血症、低鉀血症和肝酶升高。經檢查，患者出現疲倦和高熱（39.1°C），128 次/分時心動過速，97/61 mmHg 時臨界低血壓。他還報告說他有頭暈和噁心。他否認有任何腹痛，觸診時也沒有任何壓痛。

- 呼吸道病毒profile ，結果為陰性，尿液分析也為陰性。快速*鏈球菌*檢測和尿液*軍團菌*抗原均呈陰性。凝血酶原時間（PT）和國際標準化比值（INR）分別升高 16 秒和 1.4 秒。丙氨酸轉氨酶（ALT）、天冬氨酸轉氨酶（AST）和膽紅素也分別升高至 69 U/L、51 U/L 和 33.8 μmol/L（表 1）。

CRP（毫克/升）	208（1st day） 265 (2nd day)



Abd.CT

部 CT 顯示肝臟腫塊，最大的 5×5 cm 提示轉移或膿腫聚集，因為它們表現為低密度病變，沒有任何邊緣強化、內部分隔或液平面。

- 癌胚抗原（CEA）和 CA 19-9、糞便胃腸道聚合酶鏈反應（PCR）、糞便培養和潛血。他建議患者開始服用甲硝唑並繼續服用頭孢曲松，因為他的 C 反應蛋白（CRP）顯著升高至 268，降鈣素原達到 9.22（表 1）。
- 諮詢了手術團隊，沒有建議任何手術干預。糞便 PCR 顯示*志賀氏菌*陽性

Infectious panel	Value
Shigella/EIEC PCR	Positive.

PYOGENIC LIVER ABSCESS

HISTORY

- Described since the time of Hippocrates (4000 BC).
- 1890 – Osler documented amoebae in stool and abscess of the same patient.
- Dieulafoy described multiple hepatic abscess secondary to pylephlebitis following appendicitis .

(1839-1911)

- In 1938 Ochsner's classic review heralded surgical drainage as the definitive therapy.

1. PLA in Taiwan 多

- The incidence of liver abscess to be **1.1–3.3 per 100,000** person-years in general Western populations.
- Liver abscess, which is highly endemic in Taiwan, has an incidence of **11.5–17.5 per 100,000 person-years**

- 1. Hansen PS, Schønheyder HC (1998) Pyogenic hepatic abscess. A 10-year population-based retrospective study. APMIS 106: 396–402.
- 2. Mølle I, Thulstrup AM, Vilstrup H, Sørensen HT (2001) Increased risk and case fatality rate of pyogenic liver abscess in patients with liver cirrhosis: a nationwide study in Denmark. Gut 48: 260–263.
- 3. Kaplan GG, Gregson DB, Laupland KB (2004) Population-based study of the epidemiology of and the risk factors for pyogenic liver abscess. Clin Gastroenterol Hepatol 2: 1032–1038.
- 4. Meddings L, Myers RP, Hubbard J, Shaheen AA, Laupland KB, et al. (2010) A population-based study of pyogenic liver abscesses in the United States: incidence, mortality, and temporal trends. Am J Gastroenterol 105: 117–124.

- **5. Tsai FC, Huang YT, Chang LY, Wang JT (2008) Pyogenic liver abscess as endemic disease, Taiwan. Emerg Infect Dis 14: 1592–1600.**
- **6.** Gaetan Khim1,*, Sokhom Em2, Satdin Mo2, and Nicola Townell1 Liver abscess: diagnostic and management issues found in the low resource setting (Cambodia) British Medical Bulletin, 2019, 132:45–52
- PLAs have a global distribution, although incidence varies significantly between different countries from more than **900 cases in a 10-year period** in Asian countries such as Taiwan, Singapore and South Korea to 23 cases in the same timeframe in nonAsian regions.In the US, the incidence of PLA is 2.3 per 100 000, predominantly in older men and diabetes and cancer are considered risk factors to the development of PLA. The most common pathogen isolated in this setting was Streptococcus milleri followed by Klebsiella pneumoniae. This differs from South Korea and Taiwan, where K. pneumoniae is the most common pathogen found in PLA.

Epidemiology:台灣多

- 疫学

446/100,000 admissions

- 頻度
  - 18-20case/100,000入院
    2.3case/100,000人
  - 死亡率は12%
  - 原因菌ではK. pneumoniaeが最多
  - 右葉に多い（感染の機序に由来する）
- Risk factor
  - 男性 vs 女性 (3.3 vs 1.3/100,000)
  - 高齢者, 糖尿病
  - 地域性: 台湾では446/100,000入院, アジアで多い

The mortality rate was 6.5%.

Epidemiology:台灣多

疫学

446/100,000 admissions

Jpn J Infect Dis. 2005 Dec;58(6):366-8.

Pyogenic liver abscess: a retrospective analysis of 107 patients during a 3-year period

Khee-Siang Chan [1], Chin-Ming Chen, Kuo-Chen Cheng, Ching-Cheng Hou, Hung-Jung Lin, Wen-Liang Yu

Affiliations – collapse

Affiliation

1 Department of Intensive Care Medicine, Chi-Mei Medical Center, Tainan, Taiwan.

Abstract

Pyogenic liver abscess (PLA) is a potentially life-threatening disease, and early diagnosis may be difficult. In order to provide diagnostic clues and to enhance the prompt management of such cases, we retrospectively investigated the clinical characteristics of PLA during a 3-year period in a tertiary-care hospital. The crude incidence rate of PLA in our study was 446.1 per 100,000 hospital admissions. Male predominance and a mean age of 57.6 +/- 14.4 years were observed. Diabetes mellitus was the most common concomitant disease, and biliary pathologies were the most common predisposing cause of this type of abscess. The most common clinical features were fever, chills, and abdominal pain. Leukocytosis was found in 67.3% of the patients, and the observed C-reactive protein (CRP) values were high. The most common pathogen was Klebsiella pneumoniae. The mortality rate was 6.5%. A complete history, physical examination, evaluation of the white blood cell count and CRP, and the prompt arrangement of imaging studies may lead to an earlier diagnosis. The aggressive performance of image-guided catheter drainage and the appropriate administration of antibiotics may reduce the mortality rate of PLA.

Epidemiology (Taiwan)
1996->2004 增加

- 如果一家大醫院一年有20,000入院
- 446/100,000 admission發生 liver abscess.
- 一年有90例,一個月有8例,**每週有2例.**
- 相當多見
- Prevalence in Taiwan:17.6/100,000(2004)
  11.2/100,000(1996)

Pyogenic liver abscess as endemic disease, Taiwan
Tsai FC, Huang YT, Chang LY, Wang JT
Emerg Infect Dis. 2008;14(10):1592.

Incidence in other countries

Incidence of Pyogenic liver abscess

- 1 in 140 admissions in Brazil
  - Ferreira MA, Pereira FE, Musso C, Dettogni RV. Pyogenic liver abscess in children: some observations in the Espírito Santo State, Brazil. Arq Gastroenterol 1997;34:49-54
- More than 79 per 100,000 pediatric admissions in India
  - Kumar A, Srinivasan S, Sharma AK. Pyogenic liver abscess in children—South Indian experiences. J Pediatr Surg 1998;33:417-421

Liver abscess in the tropics: an experience from Jammu. (賈姆穆，是印度查謨-克什米爾邦Jammu縣的一個城鎮。總人口378431)。

Naveed S et al (India)：Scott Med J. 2014 Aug;59(3):167-71

over a period of one year (November 2011 to October 2012) to the Department of General Surgery in Acharya Shri Chander College of Medical Sciences and Hospital Sidhra, Jammu.

amoebic liver abscesses (73.33%). Escherichia coli and Klebsiella were the most common organisms cultured from the pyogenic abscesses.

Review > Infect Chemother. 2018 Sep;50(3):210-218. doi: 10.3947/ic.2018.50.3.210.

Klebsiella pneumoniae Liver Abscess

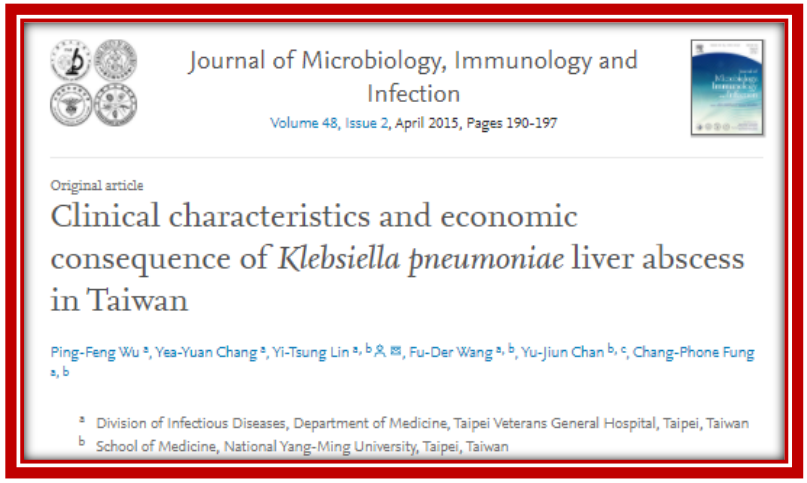
Jae Bum Jun [1]

Affiliations – collapse

Affiliation

1 Department of Internal Medicine, Ulsan University Hospital, University of Ulsan College of Medicine, Ulsan, Korea. uvgotletter@hanmail.net.

- Since the mid 1980s, the prevalence of liver abscess caused by hypervirulent ***Klebsiella pneumoniae*** **strain has increased in Asia, particularly in Taiwan and Korea.** This strain is mostly K1 or K2 serotype, and has hypercapsular and hypermucoid phenotypes. Most infections are community acquired, and patients rarely have a hepatobiliary disease prior to infection. Clinical manifestations are characterized by fever and high C-reactive protein, and metastatic infections, such as septic emboli in the lung and endophthalmitis and meningitis are frequently observed. Antibiotic resistance is rare. Antibiotic treatment and abscess drainage are needed, and early diagnosis and treatment of endophthalmitis is also important.



Journal of Microbiology, Immunology and Infection

Volume 48, Issue 2, April 2015, Pages 190-197

Original article

Clinical characteristics and economic consequence of *Klebsiella pneumoniae* liver abscess in Taiwan

Ping-Feng Wu [a], Yea-Yuan Chang [a], Yi-Tsung Lin [a, b], Fu-Der Wang [a, b], Yu-Jiun Chan [b, c], Chang-Phone Fung [a, b]

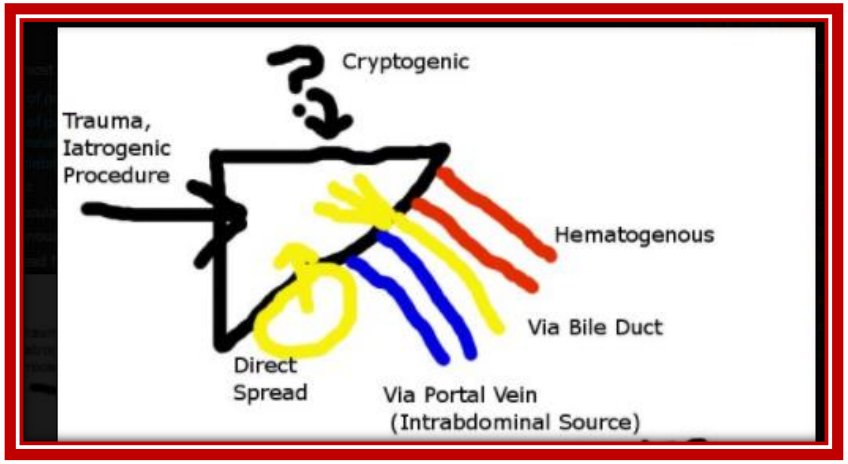
[a] Division of Infectious Diseases, Department of Medicine, Taipei Veterans General Hospital, Taipei, Taiwan
[b] School of Medicine, National Yang-Ming University, Taipei, Taiwan

Kp liver abscess in Taiwan

The median cost was $5290.80 in US dollars,

- Among patients with KPLA, the median cost was $5290.80 in US dollars, and the mean cost was $6337.50 ± $4363.40. Length of hospital stay was the only independent risk factor for the high total hospitalization expenditure. The duration of antibiotic use was nearly the same as the length of hospital stay. The prolonged stay in the general ward (≥21 days) also contributed to the high total cost of hospitalization. The independent risk factors for the high average daily cost of hospitalization were a higher Charlson Comorbidity Index and the requirement of intensive care on admission.

2. Portal of entry



? Unknown
Food origin

不明來源最多，佔50%。其他可能的來源有膽管、門靜脈、鄰近組織侵犯、治療所引起或是免疫力低下等因素。膽管來源：佔40-50%，可能為septic cholangitis, sclerosing cholangitis, Caroli’ s disease；門靜脈來源：骨盆腔或胃腸道感染引發portal pyaemia (闌尾炎、膽囊積膿、憩室炎、發炎性腸道疾病(IBD)、耶爾森氏回腸炎(Yersinia enteritis)、消化道潰瘍穿孔、腸手術吻合部外漏、胰臟炎、痔瘡感染等)；直接侵犯： 腹部穿刺傷或鈍傷、腎週膿瘍(perinephric abscess)蔓延；治療所引起：肝動脈化學栓塞(TACE), 肝腫瘤酒精注射(PEI); surgical(膽囊切除、肝移植), endoscopic or radiological (膽道支架置放)；免疫力低下：糖尿病(DM)、白血病、化學治療、類固醇使用、HIV感染等。

1. Pylephlebitis

- **Recent trend of pylephlebitis in Taiwan: *Klebsiella pneumoniae* liver abscess as an emerging etiology. Wang YF et al (NTUH):** Clinical and Epidemiological Study. December 2013, Volume 41, Issue 6, pp 1137–1143.
- **Pylephlebitis (septic thrombophlebitis of the portal venous system)** is a rare complication of intra-abdominal infection.
- **35 cases of pylephlebitis**. Most patients were men [29/35 (83 %)]. The median age of the patients was 57 years (range 35–90 years). Unspecified abdominal pain (18/35) and fever (10/35) were the most common clinical manifestations. *Klebsiella pneumoniae* liver abscess (7/35) and cholangitis (7/35) were the most common etiologies. Liver abscess was a risk factor for pylephlebitis (13/35 vs. 27/160, $P = 0.01$)

From biliary tract infection, main source

- Septic cholangitis
- Sclerosing cholangitis
- Calori disease
- Cholangiocarcinoma.
- **Intrahepatic bile duct stones**

Semin Liver Dis. 2018 Aug;38(3):270-283. doi: 10.1055/s-0038-1661363. Epub 2018 Jul 24.

Pyogenic Liver Abscess of Biliary Origin: The Existing Problems and Their Strategies.

Shi SH[1,2], Zhai ZL[1,2], Zheng SS[1,2].

Author information

1 Division of Hepatobiliary and Pancreatic Surgery, Department of Surgery, Zhejiang University, First Affiliated Hospital, School of Medicine, Hangzhou, China.

2 Key Laboratory of Combined Multi-Organ Transplantation, Ministry of Public Health, Hangzhou, Zhejiang Province, China.

From gunshot wound (GSW)

Pyogenic liver abscess (PLA) of biliary origin in Southeast Asia mainly occurs in patients with intrahepatic bile duct stone (IBDS) and extrahepatic bile duct stone (EBDS), bilioenteric anastomosis, or biliary stent. IBDS, as an endemic to Southeast Asia, remains a frequent etiology of acute cholangitis and PLA. PLA related to IBDS is characterized by high incidences of PLA recurrence and death related to infection, and difficulties in diagnosis of concomitant cholangicarcinoma.

PLA of biliary origin is more likely caused by ***Escherichia coli,*** more often presented as **polymicrobial** infections, and more associated with extended-spectrum β-lactamase (ESBL)-producing *Enterobacteriaceae* isolates. In this review, the authors summarize the differences on the presumed causes, pathogens, multidrug resistance, treatment, and prognosis of PLA between biliary origin and cryptogenic origin, the latter serving as a first and foremost presumed etiology of PLA. The authors also discuss the existing problems on early diagnosis of **concomitant cholangicarcinoma** related to IBDS.

Ir J Med Sci. 2016 Nov;185(4):797-804. Epub 2015 Sep 16.

Pyogenic liver abscess after gunshot injury: 10 years' experience at a single level 1 trauma center.

Dandin O[1], Valle EJ[2], Pimentha G[2], Schulman CI[2], Teomete U[3], Proctor KG[2], Namias N[2].

Author information

1 Division of Trauma and Surgical Critical Care, Dewitt-Daughtry Family Department of Surgery, University of Miami Miller School of Medicine, Miami, FL, USA. dandinozgur@gmail.com.

2 Division of Trauma and Surgical Critical Care, Dewitt-Daughtry Family Department of Surgery, University of Miami Miller School of Medicine, Miami, FL, USA.

3 Department of Radiology, University of Miami Miller School of Medicine, Miami, FL, USA

- **METHOD:**
- From January 1, 2004 to September 30, 2013, there were 2143 patients admitted to Ryder Trauma Center at Jackson Memorial Hospital/University of Miami with severe abdominal trauma: 1227 penetrating and 866 blunt. Among the patients who had penetrating trauma, 637 had GSWs and 551 had stab wounds. Thirty-nine patients had other kinds of penetrating traumas. **Eleven patients were identified as having liver abscess, with 8 of them belonging to the GSW group, and 3 to the blunt injury group.** The diagnosis and management of the 8 patients with a hepatic abscess after GSW to the liver were demonstrated.
- **RESULT:**
- There were seven males and one female with a mean age of 29 ± 10 years. There were one grade 2, four grade 3, two grade 4 and one grade 5 injuries. The mean abscess size was 10 ± 2 cm. The abscesses were usually caused by infection from mixed organisms. These abscesses were treated with antibiotics and drainage. No mortality and long-term morbidity were seen.
- **CONCLUSION:**
- **Hepatic abscess after GSW to the liver is a rare condition, with an incidence of 1.2 %. It is usually seen in severe liver injury** (grade 3 and above), but our patients were all treated successfully, with no mortality.

Splenectomy and pyogenic liver abscess: 2.15/1000 person-years.

J Epidemiol. 2015;25(9):561-6. doi: 10.2188/jea.JE20140267. Epub 2015 Aug 8.

Splenectomy Correlates With Increased Risk of Pyogenic Liver Abscess: A Nationwide Cohort Study in Taiwan.

Lai SW[1], Lai HC, Lin CL, Liao KF.

Author information

1 College of Medicine, China Medical University.

1. 17,779 subjects aged 20-84 years who underwent splenectomy in 1998 to 2010 (splenectomy group) and 70,855 randomly selected subjects without splenectomy (non-splenectomy group). Both groups were matched by sex, age, other comorbidities, and hospitalization year of receiving splenectomy. The incidence of pyogenic liver abscess at the end of 2011 was measured.

2. The overall incidence rate was **3.75-fold** higher in the splenectomy group than that in the non-splenectomy group (2.15 vs 0.57 per 1000 person-years; Splenectomy and pyogenic liver abscess

3. Unknown : 40-50 %

Retrospective study
最大的問題是
Unknown 多,
有沒有用心問查

4. Associated condition, risk factors

- 1.DM
- 2. Cancer, HCC
- 3. Cancer, Colorecrtal cancer
- 4. Immuno-suppressed state, such as herpex zoster
- 5. weight loss
- 6. Hemodialysis and chronic renal diseases
- 7. After surgery, after ERCP

Pyogenic liver abscess and DM

- **Characteristics of pyogenic liver abscess patients with and without diabetes mellitus.**
- Foo NP,etal(奇美):*Am J Gastroenterol. 2010 Feb;105(2):328-35. Epub 2009 Oct 13.*
- April 2001 to March 2004
- **Of the 377 patients included, 182 (48.3%) had DM. Patients with DM had higher prevalence rates of cryptogenic etiology, gas-forming nature, thrombocytopenia, hyperglycemia, growth of Klebsiella pneumonia in blood cultures,** metastatic infection, and bacteremia, but lower prevalence rates of **biliary origin**, right upper quadrant pain, and growth of Escherichia coli in pus cultures.
- **C-reactive protein and neutrophil were good biomarkers of PLA, but not asparate aminotransferase and alanine aminotransferase.**

Host factors 很重要
DM:50 % or more.

- Host factors — **Diabetes mellitus or impaired fasting glucose, present in 70 to 78 percent of patients in three series from Taiwan,** is the major observed risk factor for Klebsiella primary liver abscess (KLA) [3-6,12,13]. The high prevalence of diabetes or impaired fasting glucose in patients with KLA is not seen with other causes of liver abscess (5 percent with polymicrobial liver abscess and 33 percent with non-K. pneumoniae liver abscess in those series) [3,4].

Poor DM control

Klebsiella pneumoniae liver abscess in diabetic patients: association of glycemic control with the clinical characteristics; *Lin YT,et al ; BMC Infectious Diseases 13 (1), 56 (Jan 2013)*

Patients with uncontrolled glycemia (HbA1c>= 7 %) were significantly younger than those with controlled glycemia (HbA1c<7 %). Patients with uncontrolled glycemia had the trend to have a higher rate of gas-forming liver abscess, cryptogenic liver abscess, and metastatic infection than those with controlled glycemia.

Cryptogenic liver abscess and metastatic infection were more common in the poor glycemic control group (HbA1c value>10%) after adjustment with age. HbA1c level and abscess<5 cm were independent risk factors for metastatic complications from KPLA.

CONCLUSIONS: Glycemic control in diabetic patients played an essential role in the clinical characteristics of KPLA, especially in metastatic complications from KPLA.

PLA due to DM and non-diabetic

- Fei Wang [1], Jingwen Yu [1], Chen et al
- Dis Markers. 2022 Apr26;2022:7512736.
- **Clinical Characteristics of Diabetes Complicated by Bacterial Liver Abscess and Nondiabetes-Associated Liver Abscess (L391)**
- _61 diabetic and 61 non-diabetic

Conclusion: Clinical manifestations and laboratory results of BLA patients with and without diabetes mellitus were significantly different. The symptoms of diabetics with BLA were **serious.**

However, chill, cough and expectoration, and liver pain upon percussion were higher in the study group, while abdominal distension was lower. WBC, RBC, PA, PTA, FIB, **and CRP were hi**gher than the control group.

- Wenfei Li [1], Hongjie Chen [1], Shuai Wu [1], Jie Peng [2]
- (A comparison of pyogenic liver abscess in patients with or without diabetes: a retrospective study of 246 cases): BMC Gastroenterol, 2018 Oct 1;18(1):144. (L391 remarks)
- PLA(246 cases 合併糖尿病患者(90 cases)**年齡較大，並發症較嚴重**，心血管疾病患病率較高，以碳青黴烯類抗生素聯合治療使用增多，肺炎克雷伯菌為主要病原菌，但這些患者腹部手術較少，大腸桿菌較少。. 大腸桿菌感染。此外，**糖尿病 PLA 患者血糖控制不佳與發熱和雙葉膿腫的高發生率有關。**

ERCP septic complications

Liver abscess After ERCP and Laparoscopic Cholecystectomy. A Case Report.

Alexander Ramirez Valderrama, MD, Soni Chousleb, MD, Litong Du, MD, PhD

New York Hospital Queens

- A 32 year-old female with history of cholelithiasis, with a previous biliary colic attack two weeks before her admission. The patient was complained of abdominal pain, nauseas and vomiting for the last two days, without any fever or chills. Initial evaluation showed a patient without acute stress, with normal vital signs and right upper quadrant tenderness with positive Murphy's sign. Ultrasound (US) shows dilated CBD to 11 mm, cholelithiasis and gallbladder wall thickness. Initial labs showed elevated Liver Function Tests (LFTs) and normal white blood cells (WBC). An ERCP was done, with sphincterotomy, CBD stones extraction and stent placement. Next day patient underwent an uneventful LC and the patient was discharged home next day tolerating diet without any complications. 2 weeks after ERCP the patient was complaining of abdominal pain, nauseas, vomiting, fever and chills. The patient was re admitted and a new US (Fig. 1) showed a 5 x 5x 4 cm complex liver mass compatible with a liver abscess and a dilated CBD to 12 mm.

Herpes zoster : increased hazard of pyogenic liver abscesses.

Herpes zoster correlates with pyogenic liver abscesses in Taiwan
Shen Mei-Ling et al (TC, Taichung):Biomedicine (Taipei). 2016 Dec; 6(4): 22.

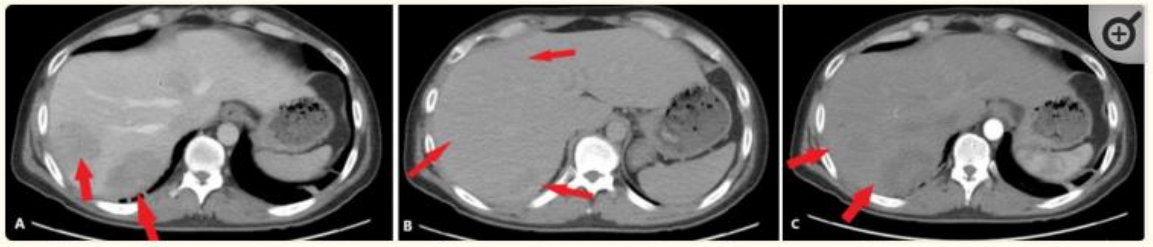
1. Taiwan National Health Insurance Program, there were 33049 subjects aged 20-84 years who were newly diagnosed with herpes zoster from 1998 to 2010 , 131707 – no zoster group
2. The overall incidence rate was **1.38-fold higher in the herpes zoster group** than in the non-herpes zoster group (4.47 *vs*. 3.25 per 10000 person-years.

Conclusions:

- Patients with **herpes zoster are associated with an increased** hazard of developing pyogenic liver abscesses.

PLA associated with Crohn's disease

- **Liver Abscess Secondary to Crohn's Disease: A Case Report**
- Ariana R Tagliaferri [1], Heemani Ruparel [1], Gabriel Melki [2], Walid Baddoura [3]
- Cureus. 2022 Mar 14;14(3):e23157. (L390)
- 一名患有Crohn's 迴腸結腸炎的患者，他出現全身性腹痛和發燒，並發現有多個化膿性肝膿腫，活檢證實是繼發於 CD。患者的肝膿腫對反复 CT 引導引流和抗生素治療無效。
- **臨床醫生通常將發熱性疾病的診斷與或不伴腹痛誤認為是 CD 的簡單再激活，因此即使他**



Computerized tomography of the abdomen and pelvis with intravenous contrast.

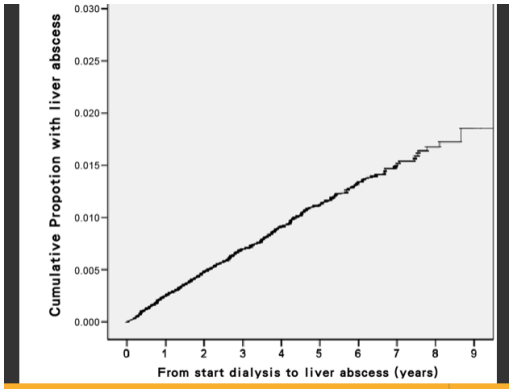
There are two ill-defined hypodense lesions in the right lobe of the liver measuring 6.3 x 4.4 and 5.2 by 4.7 cm and the left lobe 5 x 3 cm (red arrows). The lesions are predominantly hypodense compared to the liver parenchyma on venous phase (A) and arterial phase (C) with non-enhancing central hypodensities. This may represent scar or necrosis. The lesions are predominantly isodense on delayed phase imaging (B). There are few non-enhancing sub-centimeter hypodense lesions in the liver that are too small to characterize and may represent cysts.

PLA in chronic kidney disease. 1.38/1000 person years.

- **Predialysis chronic kidney disease correlates with increased risk of pyogenic liver abscess: a population-based cohort study.** Lai SW[1,2],et al : Eur J Clin Invest. 2017 Oct;47(10):694-701
- the database of the Taiwan National Health Insurance Program. There were **81118** subjects aged 20-84 years with newly diagnosed chronic kidney disease as the predialysis chronic kidney disease group since 2000-2010, and 81118 randomly selected subjects without chronic kidney disease as the nonchronic kidney disease group.
- The **overall incidence of pyogenic liver abscess was 1·65-fold** higher in the predialysis chronic kidney disease group than that in the nonchronic kidney disease group (1·38 vs. 0·83 per 1000 person-years,

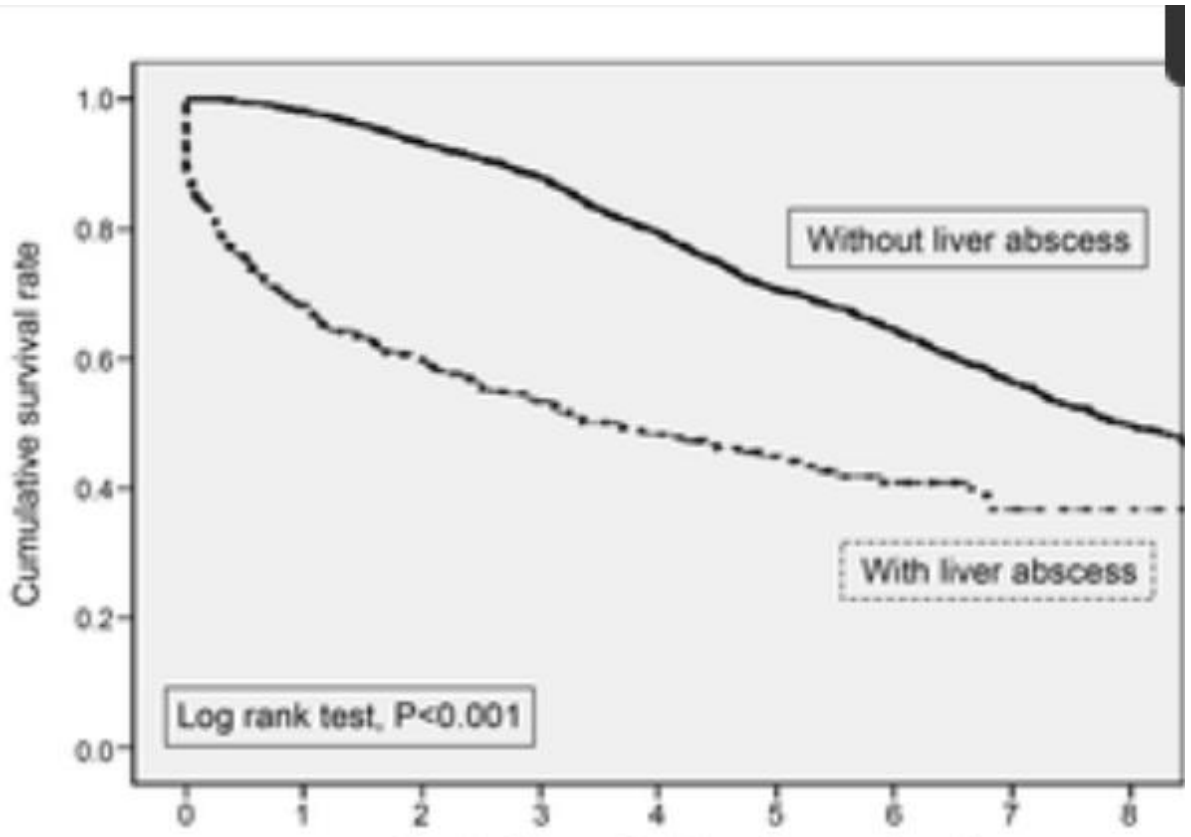
Liver Abscess in End-Stage Renal Disease Dialysis Patients: 1.1 %/5 years

- **Epidemiology and Mortality of Liver Abscess in End-Stage Renal Disease Dialysis Patients: Taiwan National Cohort Study** Chon-Seng Hong et al (CMUH). PLoS ONE9(2): e88078. February 14, 2014
- 1. National Health Insurance Research Database, we collected data from all ESRD patients who initiated dialysis between 2000 and 2006.
- 2. Of the 53,249 incident dialysis patients identified, 447 were diagnosed as having liver abscesses during the follow-up period (**224/100,000 person-years**).



- 3.The cumulative incidence rate of liver abscess was 0.3%, **1.1%**, and 1.5% at 1 year, 5 years, and 7 years, respectively.
- 4.Overall in-hospital mortality was 10.1%.

Overall survival curves after liver abscess in end-stage renal disease dialysis patients stratified by with and without liver abscess.



Number at risk

Without liver abscess	3576	3314	2984	2390	1831	1287	839	480	184
With liver abscess	447	258	186	135	98	66	41	15	3

Chon-Seng Hong et al, 2014

- **Population-based cohort study investigating the association between weight loss and pyogenic liver abscesses.**
- Lai SW[1],et al (CMUH)：Biomedicine (Taipei). 2017 Dec;7(4):26.
- Taiwan National Health Insurance Program. Totally, 8453 subjects aged 20 to 84 years with newly diagnosed weight loss between 2000 and 2012 were assigned as the weight loss group, and 33777 randomly selected subjects without weight loss .
- 1. HR of pyogenic liver abscess was **2.47** (95 %CI 1.21, 5.02) for those subjects with weight loss and without comorbidities,
- 2. Among the weight loss group, **5% developed pyogenic liver abscesses within 3 months.**

死亡率

- 已開發國家:2-12%
- 英國(2002): 12.3%
- 69cases (65 pyogenic and 4 amebic)
- 美國(2004):2/79=2.5%(NY)

Liver abscess in adults: ten years experience in a UK centre
Mohsen AH, Green ST, Read RC, McKendrick MW
QJM. 2002;95(12):797.

Pyogenic liver abscess: recent trends in etiology and mortality.
Rahimian J, Wilson T, Oram V, Holzman RS
Clin Infect Dis. 2004;39(11):1654.

Clin Infect Dis. 1998 Jun;26(6):1434-8. doi: 10.1086/516369.

Primary liver abscess due to Klebsiella pneumoniae in Taiwan

J H Wang [1], Y C Liu, S S Lee, M Y Yen, Y S Chen, J H Wang, S R Wann, H H Lin

- Pyogenic liver abscess is an uncommon complication of intra-abdominal or biliary tract infection and is usually a polymicrobial infection associated with high mortality and high rates of relapse. **However, over the past 15 years, we have observed a new clinical syndrome in** Taiwan: liver abscesses caused by a single microorganism, Klebsiella pneumoniae. We reviewed 182 cases of pyogenic liver abscess during the period September 1990 to June 1996; 160 of these cases were caused by K. pneumoniae alone, and 22 were polymicrobial. When patients with K. pneumoniae liver abscess were compared with those who had polymicrobial liver abscess, we found higher incidences of diabetes or glucose intolerance (75% vs. 4.5%) and metastatic infections (11.9% vs. 0) and lower rates of intra-abdominal abnormalities (0.6% vs. 95.5%), mortality (11.3% vs. 41%), and relapse (4.4% vs. 41%) in the former group. Liver abscess caused by K. pneumoniae is a new clinical syndrome that has emerged as an important infectious complication in diabetic patients in Taiwan.

162/180= 90 % K.p.		Polymicrobial : 22/180
DM:	KP 75 %	Polymicrobial ---4.5 %
Mortality :	11.3 %	41 %
Relapse	4.4 %	41 %

Cost : mean: 6300 USD.

- **Clinical characteristics and economic consequence of *Klebsiella pneumoniae* liver abscess in Taiwan** Ping-Feng Wu **et al (VGH-TPE)** Micro.Immunol and Infection: April 2015Volume 48, Issue 2, Pages 190–197
- 2011-2012, two years.--→153 patients with microbiological evidence of pyogenic liver abscess. The most common identified organism was
- *K. pneumoniae* (70%), followed by *E. coli* (14.4%), and *Enterococcus* species (4.6%).
- Among patients with KPLA, the median cost was $5290.80 in US dollars, and the mean cost was $6337.50 ± $4363.40. Length of hospital stay was the only independent risk factor for the high total hospitalization expenditure. The duration of antibiotic use was nearly the same as the length of hospital stay. The prolonged stay in the general ward (≥21 days) also contributed to the high total cost of hospitalization. The independent risk factors for the high average daily cost of hospitalization were a higher **Charlson Comorbidity Index** and the requirement of **intensive care** on admission.
- 簡稱CCI，Charlson合併症指數 (Charlson comorbidity index),對患者合併症情況進行積分評價.許多研究已表明,合併症對癌症患者生存率及預後有明顯影響。

Medicine (Baltimore). 2018 May;97(19):e0628. doi: 10.1097/MD.0000000000010628.

Characteristics and management of pyogenic liver abscess: A European experience.

Serraino C[1], Elia C[2], Bracco C[1], Rinaldi G[1], Pomero F[1], Silvestri A[1], Melchio R[1], Fenoglio LM[1].

Author information

1 Department of Internal Medicine, Santa Croce and Carle Hospital, Cuneo.

2 Department of Emergency Medicine, Regina Montis Regalis Hospital, Mondovì, Italy.

- Pyogenic liver abscess (PLA) are space-occupying lesions in the liver associated with high morbidity and mortality. The aim of this study is to review an **Italian** hospital experience in epidemiological, clinical patterns, and management of PLA.We performed a retrospective, descriptive case series at a single center assessing demographic characteristics, presentation patterns, etiological factors, microbiological etiology, and management for patients treated for PLA between 2000 and 2016.
- Around 109 patients were identified. The majority of patients presented with fever (73%); right upper abdominal pain in 63.3%, vomiting and nausea in 28.4%. The most common laboratory abnormality among included items was **increased C-reactive protein and fibrinogen** blood levels, respectively, in 98% and 93.9% of cases. Abdominal ultrasound was the diagnostic investigation in 42.4% of cases; CT scan and MR imaging were performed in 51.1% and 3.3% of cases respectively. We observed blood or pus culture study in 99 cases of which only 53.5% came with positive microbial reports.
- **The most common organism identified was Escherichia coli (26.5%), followed by Streptococcus spp (13.2%).** Early antibiotic treatment started on all patients and 66.7% of cases required different approaches, Ultrasound or CT-guided needle aspiration of PLA was performed in 13 patients (11%) and percutaneous abscess drainage was performed on 72 patients (67%).PLA is a diagnostically challenging problem due to nonspecific presenting characteristics. **The microbiological yield identified was a typical European spectrum with a preponderance of Escherichia coli infections. Once recognized, percutaneous drainage and antibiotic treatment are the mainstay of management for PLA.**

II. HCC and pyogenic liver abscess
肝癌中也有以類似肝膿瘍之症狀開始

肝膿瘍はHCCの初症状かも？

The American Journal of Medicine (2011) 124, 1158-1164

- 台湾における1997-2008年に報告された肝膿瘍32454例の解析
  - 平均年齢61歳. 18-106歳まで分布. 男性例が61.3%
    糖尿病41.3%, 肝硬変7.2%, 胆石症23.7%, 慢性肺疾患6.9%
  - HCCの初発症状として肝膿瘍を認めた例が2.15%あり,
    特に>65y, HBV, HCV陽性, 肝硬変(+)群ではhigh risk.
  - 60d死亡率はHCC群で14.5%, 非HCC群で8.1%と予後にも関わる.
    治療方針にも関わるため, HCCの関与の有無を評価するのは大事.

With HCC: 698
Without HCC:31756

HCC+PLA→ poor prognosis

- **Pyogenic liver abscess as the initial manifestation of underlying hepatocellular carcinoma;** Lin YT, Liu CJ, Chen TJ, et al (Taipei VGH); American Journal of Medicine 124 (12), 1158-64 (Dec 2011)
- METHODS: We extracted 32,454 patients with pyogenic liver abscess from a nationwide health registry in Taiwan during the period 1997-2008. The frequency of and risk factors for pyogenic liver abscess as the initial manifestation of underlying hepatocellular carcinoma were determined. The prognosis of these patients was compared with patients with hepatocellular carcinoma but without liver abscess.
- RESULTSA total of 698 (2.15%) patients presented with liver abscess as the initial manifestation of underlying hepatocellular carcinoma during the 12-year period. Liver cirrhosis, hepatitis B virus infection, hepatitis C virus infection, and age ≥65 years were independent risk factors for liver abscess as the initial manifestation of underlying hepatocellular carcinoma. Furthermore, these patients had a **lower 2-year survival rate** than patients with hepatocellular carcinoma but without liver abscess (30% vs 37%; P=.004). CONCLUSIONSThe prognosis of patients who presented with pyogenic liver abscess as the initial manifestation of underlying hepatocellular carcinoma was poor. Physicians should not ignore the possibility of underlying hepatocellular carcinoma in patients with risk factors for the disease in regions with a high prevalence of both pyogenic liver abscess and hepatocellular carcinoma.

Ⅲ. Colorectal cancer and Pyogenic liver abscess

TAIWAN: 大腸癌相關:5.7% (12/211)

- **Pyogenic liver abscess and colorectal neoplasia: A case series;** *Chen YY,et al ; Scandinavian Journal of Infectious Diseases (Aug 2012)(CMU, Taichung)*
- **Out of 211 cases of liver abscess included, 12** were found to be associated with colorectal neoplasia. None of these 12 cases had gastrointestinal symptoms. The stool occult blood test was positive in only 3 cases. There were 3 cases of focal adenocarcinoma in tubulovillous adenoma and the remaining 9 cases all had adenomatous polyps. Complete cure was achieved in all cases. Conclusions: When managing patients with liver abscess, colorectal neoplasia should be considered as a possible associated underlying condition.

III. CRC and pyogenic liver abscess PLA associated with CRC.

- **Pyogenic liver abscesses associated with nonmetastatic colorectal cancers: An increasing problem in Eastern Asia;** Qu K, Liu C, Wang ZX, et al ; World Journal of Gastroenterology 18 (23), 2948-55 (Jun 2012)
- RESULTS: **A total 96 cases** of colorectal cancer-related PLA were collected from the previous literature.

報告例の平均年齢 64.4±10.1y
男女比は1.5:1と男性で多い.

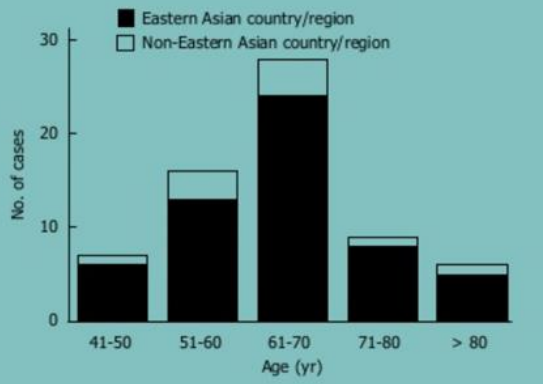


Figure 2 Age distribution of reported cases in different countries/regions.

Country/region	No. of cases	No. of articles
Eastern Asia		
Japan	40	36[6-10]
China	26	6[4,5,11-14]
Korea	8	1[15]
Singapore	3	1[16]
Middle East and Europe		
Israel	3	3[17-19]
Italy	2	2[20,21]
Spain	2	2[22,23]
Portugal	1	1[24]
France	1	1[25]
United Kingdom	1	1[26]
North and Central America		
United States	7	7[2,27-32]
Canada	1	1[33]
Netherlands Antilles	1	1[34]
Total	96	63

PLA → cancer ?

Aliment Pharmacol Ther. 2012 Sep;36(5):467-76. doi: 10.1111/j.1365-2036.2012.05212.x. Epub 2012 Jul 10.

Cancer risk in patients with pyogenic liver abscess: a nationwide cohort study.

Kao WY[1], Hwang CY, Chang YT, Su CW, Hou MC, Lin HC, Lee FY, Lee SD, Wu JC.

METHODS: Based on Taiwan's National Health Insurance Research Database, 1257 patients with PLA without prior cancers in the period 1996-2008 were identified and followed-up. The standard incidence ratio (SIR) of each cancer was calculated as the number of observed cancer cases arising among the PLA patients divided by the expected case number of cancer cases according to the national cancer rates.

RESULTS: Of the 1257 PLA patients identified, 598 (47.6%) had diabetes mellitus. After a median (±s.d.) follow-up of 3.33 ± 3.45 years, 186 were diagnosed with cancers, including 56 liver cancer, 22 biliary tract cancer and 40 colorectal cancer patients. Patients with PLA had a higher risk of all cancers (SIR, 3.83; 95% CI, 3.30-4.42), liver cancer (SIR, 7.87; 95% CI, 5.94-10.21), biliary tract cancer (SIR, 34.58; 95% CI, 21.67-52.36) and colorectal cancer (SIR, 5.27; 95% CI, 3.76-7.18). The highest SIRs of all cancers, liver cancer, biliary tract cancer and colorectal cancer occurred within 90 days of follow-up (360.82; 95% CI, 278.46-459.91, 257.28; 95% CI, 186.17-346.56, 1153.38; 95% CI 694.08-1801.24, and 52.63; 95% CI 25.2-96.8 respectively).

CONCLUSIONS: Pyogenic liver abscesses may herald the onset of cancer, especially hepato-biliary and colon cancer. Further surveys should be conducted for the detection of occult cancers in such patients.

Associated diseases :DM :47.6 %

Cancer : 186 cases----------SIR : 3.83

Liver cancer : 56, Biliary : 22--------HCC:7.87

Biliary : 34.58

Colorectal cancer : 40----------CRC: 5.27

GI cancer increased in PLA.

Gastroenterology. 2014 Jan;146(1):129-37.e1. doi: 10.1053/j.gastro.2013.09.058. Epub 2013 Oct 3.

Increased incidence of gastrointestinal cancers among patients with pyogenic liver abscess: a population-based cohort study.

Lai HC[1], Lin CC[2], Cheng KS[3], Kao JT[3], Chou JW[3], Peng CY[3], Lai SW[4], Chen PC[5], Sung FC[6].

METHODS: Using Taiwan National Health Insurance claims data, we collected data on a cohort of 14,690 patients with PLA diagnosed from 2000 to 2007. A reference cohort of 58,760 persons without PLA (controls) was selected from the same database, frequency matched by age, sex, and index year. Both cohorts were followed up until the end of 2009, and incidences of GI cancer were calculated.

RESULTS: The incidence of GI cancer was 4.30-fold higher among patients with PLA compared with controls (10.8 vs 2.51/1000 person-years). Site-specific analysis showed that the highest incidence of colorectal cancer was among patients with PLA and diabetes mellitus, followed by patients with PLA without diabetes and controls with diabetes (9.58, 5.76, and 1.49/10,000 person-years, respectively). The PLA cohort also had a high risk of small intestine cancer (adjusted hazard ratio [aHR], 12.7; 95% confidence interval [CI], 5.79-27.7) and biliary tract cancer (aHR, 9.56; 95% CI, 6.68-13.7). Their risk of pancreatic cancer (aHR, 2.51; 95% CI, 1.68-3.76) was also significant. However, patients with PLA did not have an increased risk of gastric cancer compared with controls.

CONCLUSIONS: In a population-based study, we found that the incidence of GI cancer is increased more than 4-fold among patients with PLA compared with controls. PLA might therefore be an indicator of GI cancer. Patients with PLA had the highest incidence of colorectal cancer, followed by cancers of the biliary tract, pancreas, and small intestine.

4.3 X : (10.8/1000 patient years.)

PLA following pancreaticoduodenectomy.

- **Pyogenic Liver Abscess Following Pancreaticoduodenectomy: Risk Factors, Treatment, and Long-Term Outcome;** Njoku V, et al ; Journal of Gastrointestinal Surgery (Feb 2014).
- PLA occurred in **2.6 % (22/839) of patients following PD**, with 13 patients (59.1 %) having a solitary abscess and 9 (40.9 %) multiple abscesses (1994-2008).
- No patient required surgical drainage, two abscesses recurred, and all subsequently resolved. Three patients (14 %) died related to PLA..
- Postoperative biliary fistula and need for reoperation are risk factors for PLA following PD. Antibiotics and selective percutaneous drainage was effective in 86 % of patients with no adverse effects on long-term hepatic function or survival.

Complications: Endophthalmitis : 1.92 %

- **Prevalence of and risk factors for endogenous endophthalmitis in patients with pyogenic liver abscesses**
- In Hyung Park[1],et al (Korea):The Korean Journal of Internal Medicine 2015;30(4):453-459.
- 698 cases with PLA between January 2004 and July 2013 were analyzed retrospectively ·
- **The prevalence of EE in PLA patients was 1.92%.** The mean age for all patients (373 males, 59.6%) was 62.8 years ·
- *Klebsiella pneumoniae* infection (OR, 3.68; $p = 0.039$), were risk factors for LAEE · **liver abscess-associated endogenous endophthalmitis (LAEE)**

Septic endophathalmitis

Klebsiella pneumoniae Liver Abscess, Endophthalmitis, and Meningitis in a Man with Newly Recognized Diabetes Mellitus FREE

Michael Saccente

Clinical Infectious Diseases, Volume 29, Issue 6, 1 December 1999, Pages 1570–1571,
https://doi.org/10.1086/313539
Published: 01 December 1999

US

Fig. 2. Lt. eye swelling and ecchymosis.

Fig. 3. Slit lamp showing Lt. eye conjuctival congestion and cloudy cornea.

International Ophthalmology
April 2008, Volume 28, Issue 2, pp 111–113 | Cite as

Endogenous endophthalmitis complicating *Klebsiella pneumoniae* liver abscess in Europe: case report

Authors Authors and affiliations

Edison Mutsinzi Karama, François Willermain, Xavier Janssens, Marc Claus, Sigi Van den Wijngaert, Jim-Town Wang, Claire Verougstraete, Laure Caspers

However, in Taiwan, *K. pneumoniae* as a single pathogen is the most common etiology of pyogenic liver abscess, and an association between underlying diabetes and *K. pneumoniae* liver abscess is well recognized [2–5]. Septic metastatic lesions, particularly endophthalmitis, are much more common among patients with *K. pneumoniae* liver abscess than among those with polymicrobial infection [2]. This association has been reported rarely outside of Taiwan [7, 8], and review of the literature failed to identify any previous report of this disease from the United States.

Arch Intern Med. 1986 Oct;146(10):1913-6.

Klebsiella pneumoniae liver abscess associated with septic endophthalmitis.

Liu YC, Cheng DL, Lin CL.

International Journal of Diabetes Mellitus 2 (2010) 64–66

Contents lists available at ScienceDirect

International Journal of Diabetes Mellitus

journal homepage: ees.elsevier.com/locate/ijdm

Case Report

Endogenous endophthalmitis secondary to pyogenic liver abscess

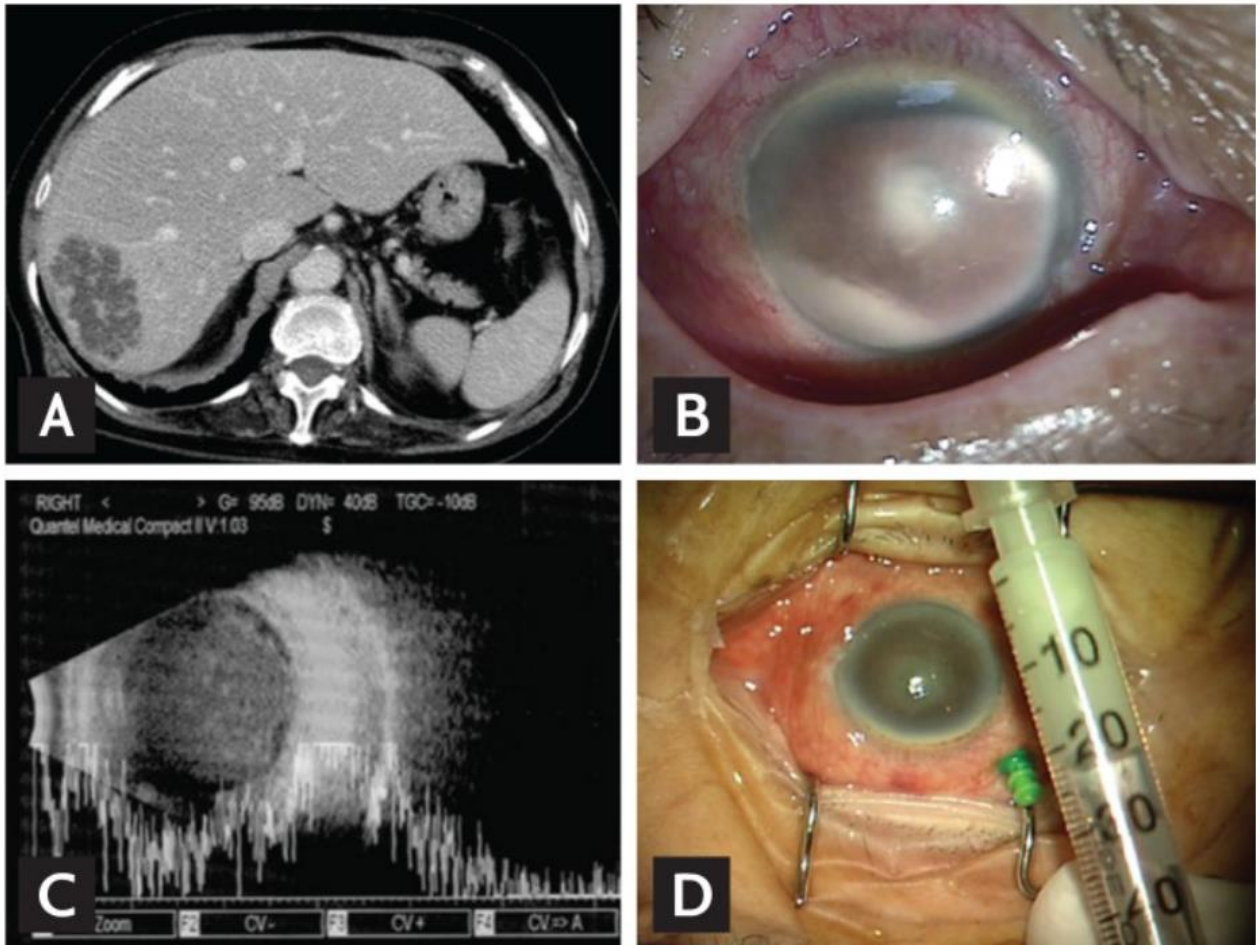
Musleh Saleh Al-Amri *

Diabetes Center, King Fahad Military Hospital, P.O. Box 101, Khamis Mushait, Saudi Arabia

PATIENT AGE : 55

To have **seven c**ases of K pneumoniae liver abscess complicated by septic endophthalmitis during a period of four years in one hospital is very unusual. To our knowledge, it has never been reported in the literature.

1986



(A) Abdominal computed tomography revealing a 4.5 × 6.7 × 5.8 cm liver abscess in the right hepatic dome of a 73-year-old woman who presented with fever, chills, and blurred vision. (B) Image of an eye with endophthalmitis. Note pus accumulation in the anterior chamber (hypopyon) associated with a cloudy cornea. (C) A B-scan orbital ultrasonogram revealed a dense vitreous solution of high opacity.
(D) Intravitreal tapping was performed and antibiotics were injected through a 25-G Trocar cannula.

PLA→ endophalmitis

- **A One-year Follow-up Study on the Incidence and Risk of Endophthalmitis after Pyogenic Liver Abscess;**Hu CC, Ho JD, Lou HY, Keller JJ, Lin HC; Ophthalmology (Jul 2012)
- This study used data sourced from Taiwan's National Health Insurance Research Database. In total, 12 727 patients with PLA were included in the study group and 63 635 matched subjects were randomly extracted as a comparison
- 148 subjects (0.10%) were diagnosed with endophthalmitis during the 1-year follow-up period. Endophthalmitis was found in 106 patients (**0.84%)** with PLA and 42 comparison patients **(0.07%).** After adjusting for patient monthly income, geographic location, and urbanization level, those suffering from PLA were found to have a greater likelihood of developing endophthalmitis during the 1-year follow-up period than comparison patients (hazard ratio [HR], **12.83**

- **More Than Meets the Eye: Klebsiella pneumoniae Invasive Liver Abscess Syndrome Presenting with Endophthalmitis.** Van Keer J[1],et al (Belgium): J Emerg Med. 2017 Jun;52(6):e221-e223.
- an 84-year-old man who presented to the emergency department with fever, orbital cellulitis, and bilateral visual loss. Although the patient had no overt abdominal symptoms, computed tomography scan revealed a **pyogenic liver abscess**. Blood cultures were positive for K. pneumoniae. Initial treatment consisted of intravenous ceftriaxone and intravitreal ceftazidime. A unilateral vitrectomy was performed. The patient survived with severe visual sequelae.
- **K. pneumoniae pyogenic liver abscess with metastatic endophthalmitis is a relatively new syndrome** that should be considered in patients presenting with acute vision loss who appear septic, with or without abdominal complaints

IV Causative microorganisms致病細菌: 台灣以KP為主

(二) 致病菌

統計上，腸道格蘭氏陰性桿菌Enteric GNB最常見，台灣尤以Klebsiella pneumoniae為甚。而在接受肝動脈化療後的患者（Post-TACE），需考慮GPC (eg. Staphylococcus等)的可能性。除此之外，也常有厭氧菌的合併感染，因此在採檢血液、膿瘍(70-90%)、或膽汁時，需同時送驗。若是培養陰性，可能是因為檢體沒有保持在絕對無氧的狀態，也可能是近期有使用抗生素或是治療中才送驗。(這時可以考慮PCR，也有極少數為發炎性腸道疾病造成的無菌性膿瘍IBD related aseptic abscess)

Causative micro-organisms

- The most common bacteria that cause liver abscesses are:
- Bacteroides
- Enterococcus
- *Escherichia coli*
- **Klebsiella**
- Staphylococcus
- Streptococcus .
- **In most cases, more than one bacteria is found**.

致病細菌

亞洲地區多Kp、

- 原因菌;
  - アジアでは, GNRが多く, 特にKlebsiella pneumoniae.
  - 海外はGP, GNが同等程度

Table 2 Constituent ratio of pus bacterial cultures *n* (%)

Pathogens	Eastern Asia (*n* = 49)	Non-Eastern Asia (*n* = 9)	Total (*n* = 58)
Bacteria			
Gram negative bacteria			
Klebsiella pneumoniae	28 (57.14)	1 (11.1)	29 (50.0)
Fusobacterium species	4 (8.16)	0	4 (6.90)
Bacteroides species	2 (4.08)	1 (11.1)	3 (5.17)
Escherichia coli	0	1 (11.1)	1 (1.72)
Pseudomonas aeruginosa	1 (2.04)	0	1 (1.72)
Gram positive bacteria			
Streptococcus species	1 (2.04)	3 (33.3)	4 (6.90)
Enterococcus faecium	2 (4.08)	0	2 (3.44)
Polymicrobial	0	2 (22.2)[1]	2 (3.44)
Amoebae	2 (4.08)	0	2 (3.44)
Negative	9 (18.37)	1 (11.1)	10 (17.24)

- **Liver abscess and sepsis caused by Clostridium perfringens and Klebsiella oxytoca.** Paasch C[1],et al (Berlin): Int J Surg Case Rep. 2017 Oct 26;41:180-183.
- A male patient at the age of 64, who suffered from nausea and progressive pain in the right upper abdomen. A computer tomography of the abdomen revealed a 7×5,6cm sized entrapped air in liver segment VII→He was operated. Microbiological examination isolated C. perfringens and K. oxytoca. The patient survived.
- 結論When diagnosing an LA caused by C. perfringens (產氣莢膜梭菌) an immediate surgical debridement and antimicrobial treatment is mandatory for the patient's survival.

Symptoms 症狀

(三) 臨床症狀

理學檢查上，病患可以有右上腹痛、發燒(可能是唯一的症狀，FUO的DDx需納入)、肝腫大。血液學檢查可見白血球增加(leuckocytosis)、ALP(↑)、ESR/CRP(⇧) (若T-bil↑，需考慮膽道疾病)。若為K. pneumonia 所致肝膿瘍，可能會伴有眼內炎(endophthalmitis)的情況。視力衰退、眼球疼痛、結膜紅腫等症狀，往往暗示視力恢復的預後不佳。應照會眼科醫師進一步評估玻璃體內抗生素治療(intravitreous injection ABx, eg. vancomycin+ ceftazidime)的可行性。

@@FOU時要考慮liver abscess, FUO的原因很多

Classic FUO [edit]

This refers to the original classification by Petersdorf and Beeson. Studies show there are five categories of conditions:

- infections (e.g. abscesses, endocarditis, tuberculosis, and complicated urinary tract infections),
- neoplasms (e.g. lymphomas, leukaemias),
- connective tissue diseases (e.g. temporal arteritis and polymyalgia rheumatica, Still's disease, systemic lupus erythematosus, and rheumatoid arthritis),
- miscellaneous disorders (e.g. alcoholic hepatitis, granulomatous conditions), and
- undiagnosed conditions.[1][3]

Causes of FUO in the elderly

Principles of Geriatic Med. And Gerontology, 1998

General classifications/Systems	Specific causes	Percent	Subtotal
Infection	Intraabdominal Abscess	12%	35%
	Tuberculosis	6%	
	Infective endocarditis	10%	
	Other	7%	
Collagen vascular diseases	Temporal arteritis	19%	28%
	Polyarteritis nodosa	6%	
	Other	3%	
Neoplasms	Primary tumors	9%	19%
	Lymphomas/Hematologic cancer	10%	
Neurologic	Degenerative CNS disorder		9%
	Sarcoid meningitis		
Hemolytic	Hemolytic disease		
Cardiopulmonary	Thrombophlebitis		
	Pulmonary embolism		
Gastrointestinal	Inflammatory bowel disease		
	Alcoholic hepatitis/cirrhosis		
	Granuloma hepatitis		
Rheumatologic	Still's disease		
Endocrine	Pheochromocytoma		
	Hyperthyroid		
Pharmacological	Drug fever		
Psychogenic	Factitious		
	Unknown	9%	9%

FUO in Taiwan (NTUH, 2003)

- Liu KS et al :J. Microbil Immunol. and Infection, 2003
- 1999-2002,
- 78 cases,
- Infectious diseases :
- 42.3 %
- Neoplasm : 6.4%
- Non-infectious inflammatory : 20.5 %
- Others : 7.7 %
- Unknown : 23.1 %

- **TB: 14.1 %**
- AIDS : 7.7 %
- **Infection remains the most important cause of classic FUO.**

FUO in Taiwan: (Eda UH, 2006)

Chin C et al : Infection: April, 2006

Results: A total of 94 cases met the criteria of FUO. The final diagnoses of FUO consisted of 54 infectious diseases (57.4%), 8 hematologic/neoplastic (8.5%), 7 noninfectious inflammatory (7.4%), 8 miscellaneous (8.5%) and 17 undiagnosed (18.1%) cases. The single most common cause of FUO was tuberculosis. Some infectious diseases, such as rickettsiosis and melioidosis, were rarely reported in western countries. Three patients with hemophagocytotic syndrome without ascertainable etiologies were present with FUO in this study. Between the patients with and those without a final diagnosis, the short-term survival (3 months) was compared by the Kaplan–Meier analysis, which revealed no difference.

Conclusions: Mycobacteriosis is still the leading cause of FUO in Taiwan and it is important to identify this treatable disease from all causes of FUO. This study has showed geographical variation among the studies of FUO.

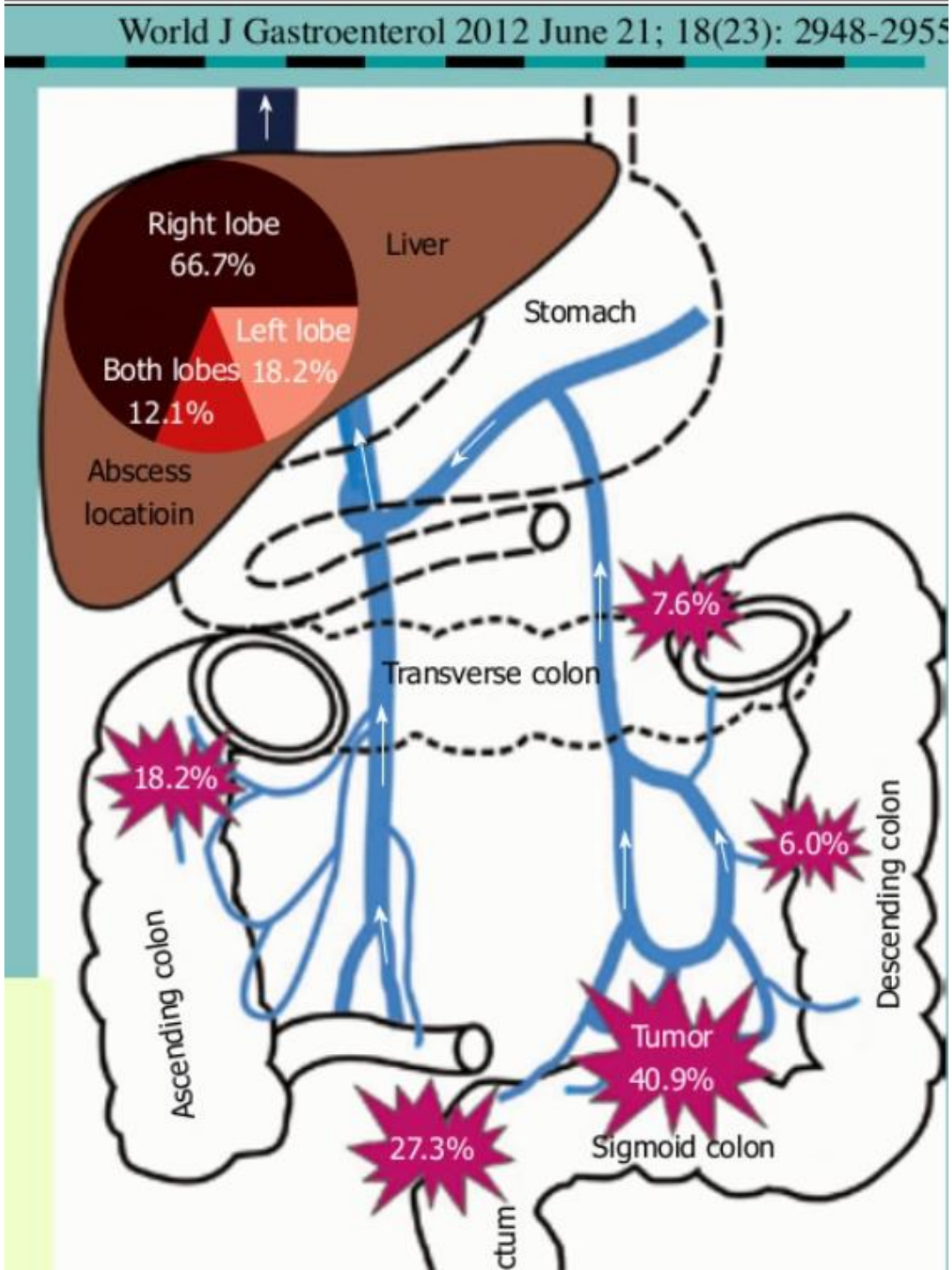
- **FUO**
- **94 cases**
- 54(57,4%)
- Infectious diseases.
- TB 多
- Undx.—18%

FUO in Netherlands, multicenter study

week, without a diagnosis being reached. A total of 167 immunocompetent patients with FUO were thus retrieved, of whom 43 (25.7%) had infections, 21 (12.6%) had neoplasms, and 40 (24.0%) had noninfectious inflammatory diseases. No diagnosis was made in 50 patients (29.9%), 37 of whom recovered spontaneously. This study confirms the changing spectrum of diseases causing FUO. Indeed, as shown by another recent study, the group of patients with FUO in whom no diagnosis can be made is expanding, and mostly it concerns self-limiting or benign fevers. Others have suggested that this trend is not really occurring (29). We did not place patients with diseases of unknown origin in the "nondiagnosis" group, and indeed made presumptive diagnoses when necessary. Nevertheless, this category of undiagnosed fevers is increasing. We believe that the higher percentage of undiagnosed cases can be attributed to the greater use of advanced diagnostic techniques attendant on an increased number of self-limited illnesses in patients meeting criteria for FUO. Because of

167 cases,
43 (25.7 %) – infection
21 (12.6%) –neoplasm
40 (24.0%) –non-infectious inflammatory diseases.
50 (29.9%) — undiagnosed

肝膿瘍之分佈



Right lobe---66.7 %
Left ----------18.2 %
Bilateral----12.1 %

比較台灣.韓國及美國的肝膿瘍

	USA (n=38[21,24])	South Korea (n=321[11,12])	Taiwan (n=512[25-28])
Mean age (years)	53·6	59·9	57·4
Men	68% (26/38)	42% (136/321)	63% (321/512)
Ethnic origin			
Asian	50% (16/32)*	100% (58/58)†	100% (512/512)
Hispanic	25% (8/32)*	..	..
Black	13% (4/32)*	..	..
White	9% (3/32)*	..	..
Underlying disorder			
Diabetes mellitus	29% (11/38)	38% (122/321)	63% (323/512)
Hepatobiliary disease	18% (7/38)	20% (64/321)	25% (127/512)
Cancer	3% (1/38)	6% (20/321)	7% (38/512)
Alcoholism	0	16% (50/321)	8% (40/512)
Chronic renal failure	0	<1% (1/321)	3% (16/512)
Bacteraemia	74% (28/38)	48% (153/321)	61% (312/512)
Single abscess	74% (28/38)	62% (198/321)	77% (392/512)
Multiple abscesses	26% (10/38)	38% (123/321)	23% (120/512)

Single abscess	74% (28/38)	62% (198/321)	77% (392/512)
Multiple abscesses	26% (10/38)	38% (123/321)	23% (120/512)
Location of abscess			
Right hepatic lobe	65% (24/37)‡	64% (37/58)§	65% (333/512)
Left hepatic lobe	24% (9/37)‡	24% (14/58)§	25% (129/512)
Both lobes	11% (4/37)‡	12% (7/58)§	10% (50/512)
Metastatic infection	24% (9/38)	8% (26/321)	15% (62/428)¶
Lung	16% (6/38)	3% (2/58)§	4% (16/428)¶
Eye	11% (4/38)	..§	4% (18/428)¶
CNS	8% (3/38)	2% (1/58)§	5% (21/428)¶
Muscular and skeletal system	3% (1/38)	..§	2% (9/428)¶
Urinary system	3% (1/38)	..§	<1% (1/428)¶
Mortality	8% (3/38)	4% (10/263)‖	6% (30/512)

Table 6

Klebsiella spp. liver abscess compared with other primary pyogenic liver abscess, NTUH, Taiwan, 1996–2004*

Item	*Klebsiella* spp.	Non-*Klebsiella* spp.	p value†
Total no.	286	72	
Male gender, no. (%)	191 (66.8)	45 (62.5)	0.490
Deaths, no. (%)	7 (2.4)	8 (11.1)	0.004
Abscess drainage, no. (%)	204 (71.3)	49 (68.1)	0.664
Biliary procedure, no. (%)	2 (0.7)	9 (12.5)	<0.001
Mixed infection, no. (%)	13 (4.5)	19 (26.4)	<0.001
Diabetes mellitus, no. (%)	100 (35.0)	13 (18.1)	0.007
Peptic ulcer, no. (%)	10 (3.5)	7 (9.7)	0.055
Urinary tract infectio, no. (%)	14 (4.9)	2 (2.8)	0.749
Renal disease, no. (%)	25 (8.7)	6 (8.3)	1.000
Hypertension, no. (%)	55 (19.2)	14 (19.4)	1.000
Heart disease, no. (%)	28 (9.8)	9 (12.5)	0.517
Cerebrovascular accident, no. (%)	7 (2.4)	3 (4.2)	0.427
Malignancy, no. (%)	15 (5.2)	15 (20.8)	<0.001
Cirrhosis, no. (%)	5 (1.7)	2 (2.8)	0.632
Pneumonia, no. (%)	35 (12.2)	6 (8.3)	0.414
Viral hepatitis, no. (%)	4 (1.4)	1 (1.4)	1.000
Meningitis, no. (%)	3 (1.0)	0 (0.0)	0.613
Endophthalmitis	9 (3.1)	0 (0.0)	0.214
Age, y, mean (SD)	57.39 (15.52)	55.25 (19.26)	0.384
No. hospitalizations, mean (SD)	26.12 (16.36)	43.06 (69.64)	0.044

*NTUH, National Taiwan University Hospital. The χ^2 test and Student *t* test were used for statistical analyses.
†p<0.05 is considered statistically significant.

台大醫院統計

K. infection之死亡率較低,KP 死亡率才2.4%.

Treatment of pyogenic liver abscess

- Some people can be successfully treated for PLA with antibiotics alone. Most, however, **need drainage of the abscess**, which is considered to be the ideal therapy for PLA. This involves inserting a needle and possibly placing a drainage catheter into the abscess to remove the infection-containing pus.

治療 Pyogenic liver abscess
IV 2 weeks then oral for 4-6 weeks

(一) Pyogenic

膿液抽取(必需)合併抗生素治療，靜脈注射2週，其後改口服3-6週)。 抗生素選則一般用Cephalosporin(3-Ceph preferred) + (aminoglycoside)+ anti-anaerobic(eg. Clindamycin, metronidazole)。替代藥物包含: amoxicillin/ clavulanic acid, piperacillin/ tazobactam等。既使治療有效，發燒仍可能持續1~2週。

若是K. pneumoniae 感染合併糖尿病時: (需參考本院感控中心抗生素感受性報表)，若有盒併眼內炎，則用高劑量 ceftriaxone 2g IV Q12H並立即照會眼科醫師。若無併發症，則只要考慮抗生素的膿瘍穿透能力及感受性試驗結果即可。

膿瘍引流方式包括超音超音波導引(echo-guided)的細針抽吸 (fine needle aspiration)及引流管放置 (pig-tail insertion)。若是狀況緊急時，也可考慮電腦斷層導引(CT-guided)的引流管放置。若是治療差，則考慮外科引流。

Treatment

Empiric antibiotic therapy for gram-negative and anaerobic pathogens

Regimen	Dose (adult)*
First choice	
Monotherapy with a beta-lactam/beta-lactamase inhibitor:	
Piperacillin-tazobactam•	3.375 or 4.5 g IV every six hours
Ticarcillin-clavulanate	3.1 g IV every four hours
Combination third generation cephalosporin **PLUS** metronidazole:	
Ceftriaxone **plus**	1 g IV every 24 hours or 2 g IV every 12 hours for CNS infections
Metronidazole	500 mg IV every eight hours
Alternative empiric regimens	
Combination fluoroquinolone$^{\Delta}$ **PLUS** metronidazole:	
Ciprofloxacin **or**	400 mg IV every 12 hours
Levofloxacin **plus**	500 or 750 mg IV once daily
Metronidazole	500 mg IV every eight hours
Monotherapy with a carbapenem$^{\diamond}$:	
Imipenem-cilastatin	500 mg IV every six hours
Meropenem	1 g IV every eight hours
Doripenem	500 mg IV every eight hours
Ertapenem§	1 g once daily

Treatment-1

TREATMENT

Drainage and General Management

- Abscess drainage is the optimal therapy for pyogenic liver abscesses.
  - Aspirate should be sent for Gram stain and aerobic/anaerobic culture.
  - Evaluation for fungal and mycobacterial pathogens. *E. histolytica* should be considered based on epidemiologic factors.
- CT- or US-guided percutaneous needle aspiration +/- catheter drainage initial method of choice:
  - Success in up to 90% of cases.
  - If drainage inadequate, surgical drainage may be required.
  - Percutaneous aspiration without catheter placement: recently found to have similar success rates as catheter placement.
    - Repeat aspiration required in approximately 50%.
    - Catheter placement should be considered in larger abscesses (>5 cm diameter).
  - Complications of percutaneous drainage include: perforation of adjacent abdominal organs, pneumothorax, hemorrhage and leakage of abscess contents in peritoneum.

Treatment-2

- General recommendations are for at least one week of drainage with CT follow-up.
- Surgical drainage: may consider as primary treatment in certain settings.
  - Complex or ruptured abscess
  - Multiple abscesses
  - Percutaneously unreachable abscess
  - Larger abscesses (> 5 cm)
  - If associated surgical problem also present (e.g., peritonitis)
  - Drainage may be done laparoscopically
- Hepatotomy: generally successful approach, but improvements in percutaneous techniques make it secondary management in most cases.
- Medical management: consider in patients at high risk for drainage procedures or with small/multiple abscesses (< 3-5 cm in diameter) not amenable to drainage.

Liver abscess(amebic or Pyogenic)

- Amebic liver abscess大大減少, PLA 還很多.
- L404, **Current Status of Amebic Liver Abscess in Korea Comparing with Pyogenic Liver Abscess**
- Eunju Kim [1], Dong-Hee Park [1], Kyung-Joong Kim [1],et al
- Korean J Gastroenterol 2020; 76(1): 28-36
- 在 2010 年 3 月至 2016 年 10 月期間，確定了 413 名肝膿腫患者。其中，對 209 名患者進行了*溶組織大腸桿菌的血清學檢測*。15 例 (7.2%) 被歸類為阿米巴肝膿腫，其餘被診斷為化膿性肝膿腫。
- Liver abscess—413 cases amebic liver abscess---15 cases (7.2%)
- Procalcitonin was lower in amebic liver abscess than the pyogenic one.

	Amebic	PLA	
GGT (U/L)	147 (75-345)	129 (64-246)	0.521
Total bilirubin (mg/dL)	1.0 (0.6-1.9)	1.0 (0.6-1.6)	0.853
Albumin (g/dL)	3.0 (2.6-3.2)	3.0 (2.6-3.3)	0.774
Creatinine (mg/dL)	0.94 (0.85-1.08)	1.06 (0.88-1.33)	0.174
Glucose (mg/dL)	149 (123-236)	137 (113-178)	0.341
PT INR	1.25 (1.19-1.29)	1.20 (1.13-1.29)	0.797
CRP (mg/dL)	16.7 (11.1-21.3)	18.0 (11.5-25.2)	0.669
Procalcitonin[b] (ng/mL)	1.47 (0.32-2.44)	3.07 (0.86-24.5)	<0.001
HBsAg	0 (0.0)	8 (4.5)	1.000
Anti-HCV	0 (0.0)	0 (0.0)	NA
Anti-HIV	1 (10.0)	0 (0.0)	0.063
Diabetes mellitus	8 (53.3)	54 (28.1)	0.047

Liver abscess

- L406, Gastroenterol Clin North Am. 2020 Jun;49(2):361-377.
- doi: 10.1016/j.gtc.2020.01.013.
- **Pyogenic and Amebic Infections of the Liver**
- Rebecca Roediger [1], Mauricio Lisker-Melman [2]
- [1]Division of Gastroenterology, Hepatology Program, Washington University School of Medicine, 660 S. Euclid Avenue, St. Louis, MO 63110, USA.

KEY POINTS

- Pyogenic liver abscesses are localized collections of pus from a bacterial cause. Biliary disease is the most common cause of pyogenic liver abscess.
- Amebic liver abscess is caused by *Entamoeba histolytica*, which is acquired by fecal-oral transmission and in rare cases becomes invasive. Liver abscesses are the most common extraintestinal manifestation of *E histolytica*.
- Both pyogenic and amebic liver abscesses are diagnosed based on imaging, either computed tomography or ultrasonography.
- The treatment of pyogenic liver abscess is antibiotics to target the causative organism along with drainage either by percutaneous catheter or aspiration.
- Amebic liver abscesses are treated with metronidazole and only 15% of cases require percutaneous drainage.

Liver abscess in UAE. (2021)
45 cases(PLA: 37, ALA: 8)

- L407. Trop Dis Travel Med Vaccines . 2021 Jun 12;7(1):17.
- doi: 10.1186/s40794-021-00140-8.
- **Importation of Entamoeba histolytica and predominance of Klebsiella pneumoniae in liver abscesses: a 7-year retrospective cohort study from the United Arab Emirates**
- Hussam Mousa [1 2], Ghada Salameh Mohammed Al-Bluwi [3], Zainab Fathi Mohammed Al Drini [3], Huda Imam Gasmelseed [4], Jamal Aldeen Alkoteesh [5], Zahir Osman Eltahir Babiker.
- 結果： 在 **45** 名患者中，**82.2% (37/45)** 有化膿性肝膿腫 **(PLA)**，**17.8% (8/45)** 有阿米巴肝膿腫 **(ALA)**。
- 總體而言，患者年輕（中位年齡 42 歲，IQR 35-52），大多數來自印度次大陸（55.6%，25/45）的男性（77.8%，35/45），出現發燒（88.9%，40/45）) 和腹痛 (88.9%, 40/45)，影像學顯示孤立性膿腫 (71.1% (32/45)。粗略的年發病率為 35.9/100,000 次住院 (95% CI 26.2-48.0) 和 5.9/ 100,000 名居民 (95% CI 4.3-7.9)。所有 ALA 患者均來自印度次大陸 (100%, 8/8)。**肺炎克雷伯菌是 PLA 中最常見的病原體 (43.2% [16/37], 95% CI 27.1 -60.5%）。ALA（7.5 天，IQR 7-8.5）的住院時間比 PLA（14 天，IQR 9-17）短。住院 30 天內沒有死亡記錄。**

DD with amebic liver abscess

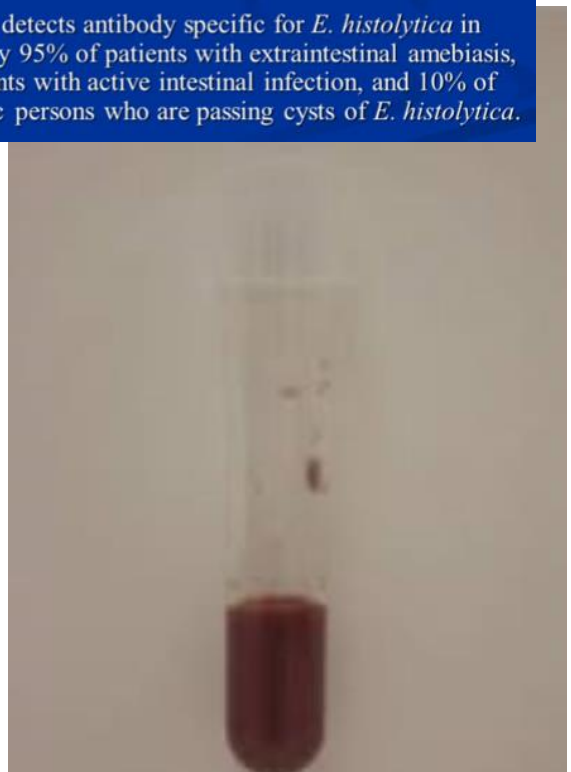
PYOGENIC VS AMEBIC LIVER ABSCESS

CLINICAL FEATURES	PYOGENIC LIVER ABSCESS	AMOEBIC LIVER ABSCESS
AGE	>50	20-40
M:F RATIO	1.5:1	>10:1
SOLITARY VERSUS MULTIPLE	SOLITARY 50%	SOLITARY 80%
LOCATION	USUALLY RIGHT LOBE	USUALLY RIGHT LOBE
TRAVEL IN ENDEMIC AREAS	NO	YES
DIABETES	MORE COMMON	UNCOMMON
ALCOHAL USE	COMMON	COMMON
JAUNDICE	COMMON	UNCOMMON
ELEVATED ALKALINE PHOSPHATASE	COMMON	COMMON
POSITIVE BLOOD CULTURE	COMMON	POSITIVE AMEBIC SEROLOGY

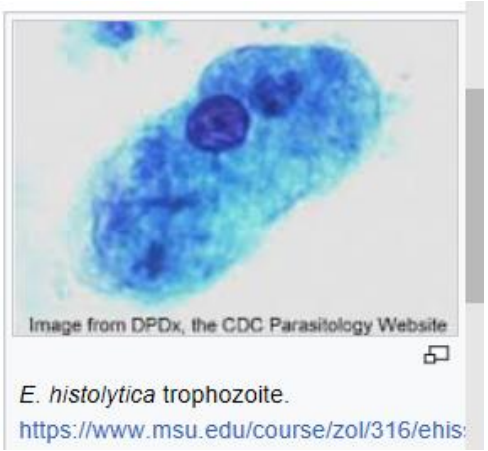
Amebic liver abscess: Dx.

Immunodiagnosis (Antibody Detection)

- 1- Antibody detection
- 2- Antigen detection may be useful as an adjunct to microscopic diagnosis
- The indirect hemagglutination (IHA)
- The EIA test detects antibody specific for *E. histolytica* in approximately 95% of patients with extraintestinal amebiasis, 70% of patients with active intestinal infection, and 10% of asymptomatic persons who are passing cysts of *E. histolytica*.



IHA



E. histolytica trophozoite.
https://www.msu.edu/course/zol/316/ehis

Amoebic or pyogenic liver abscess Easy ways to differentiate.

- Typically the aspirate in hepatic amoebiasis is pinkish-brown, odourless, and bacteriologically sterile; a thinner, malodorous, or frothy aspirate suggests bacterial infection. A therapeutic amoebicide trial is generally preferable to diagnostic needling of the liver.

Needle aspiration of the liver may be necessary for diagnostic or therapeutic purposes

Pus culture
IHA test.

IHA in amebic liver absces— false (-)

- **False-negative serologies in amebic liver abscess: report of two cases;** Otto MP, Gérôme P, Rapp C, Pavic M, Vitry T, Crevon L, Debourdeau P, Simon F; Journal of Travel Medicine 20 (2), 131-3 (Mar 2013)

- Amebiasis, the parasitic disease caused by Entamoeba histolytica, may result in extra-intestinal diseases among which liver abscess is the most common manifestation. We report two cases of amebic liver abscess illustrating the inequal sensitivity of serologic tests detecting anti-amebic antibodies.
- **@@@ NTUH: 使用 steroid 病人之 antibody 產生差 IHA (-)**

IHA : often > 1000x

- A Note on Indirect Hemagglutination (IHA) Antibody Titers Among Hospitalized Patients in Thailand With Amebic Liver Abscesses. Medscape Sunday, September 9, 2018

A retrospective case review was performed on 39 hospitalized patients in Thailand with the diagnosis of amebic liver abscess.
Average indirect hemagglutination (IHA) titer of the cases was 1:1190.35 +/- 895.42 (range, 1:256 to 2048).

SERODIAGNOSIS OF AMOEBIC LIVER ABSCESS BY IHA METHOD

Pages with reference to book, From 262 To 264

Masood Hameed Khan, Rana Qamar, Zaman Shaikh (Department of Medicine, Medical Unit-3, Civil Hospital, Karachi.)

Abstract

Serological test based on HA (Indirect Haemagglutination Method) was performed in 100 cases of hepatic abscess. The test was 100% sensitive and 94% specific. The cut off point of antibody titer between normal population and patients with invasive amoebiasis was 1:128. Antibodytiter in amoebic liver abscess was 1:5242 ±2795. A significant (P <0.001) correlation was found between total leucocyte count and antibody titer (JPMA 39: 262, 1989).

TABLE. Correlation between TLC and antiamoebic antibody titer N=96 P < P.001.

No. of cases	TLC (MEAN) (Neutrophil %)	Titer
6	11,700/cumm (76%)	1:1024
20	14,380 (70%)	1:2048
27	19,843 (76%)	1:4096
43	24,633 (75%)	1:8192

Treatment of amebic liver abscess,

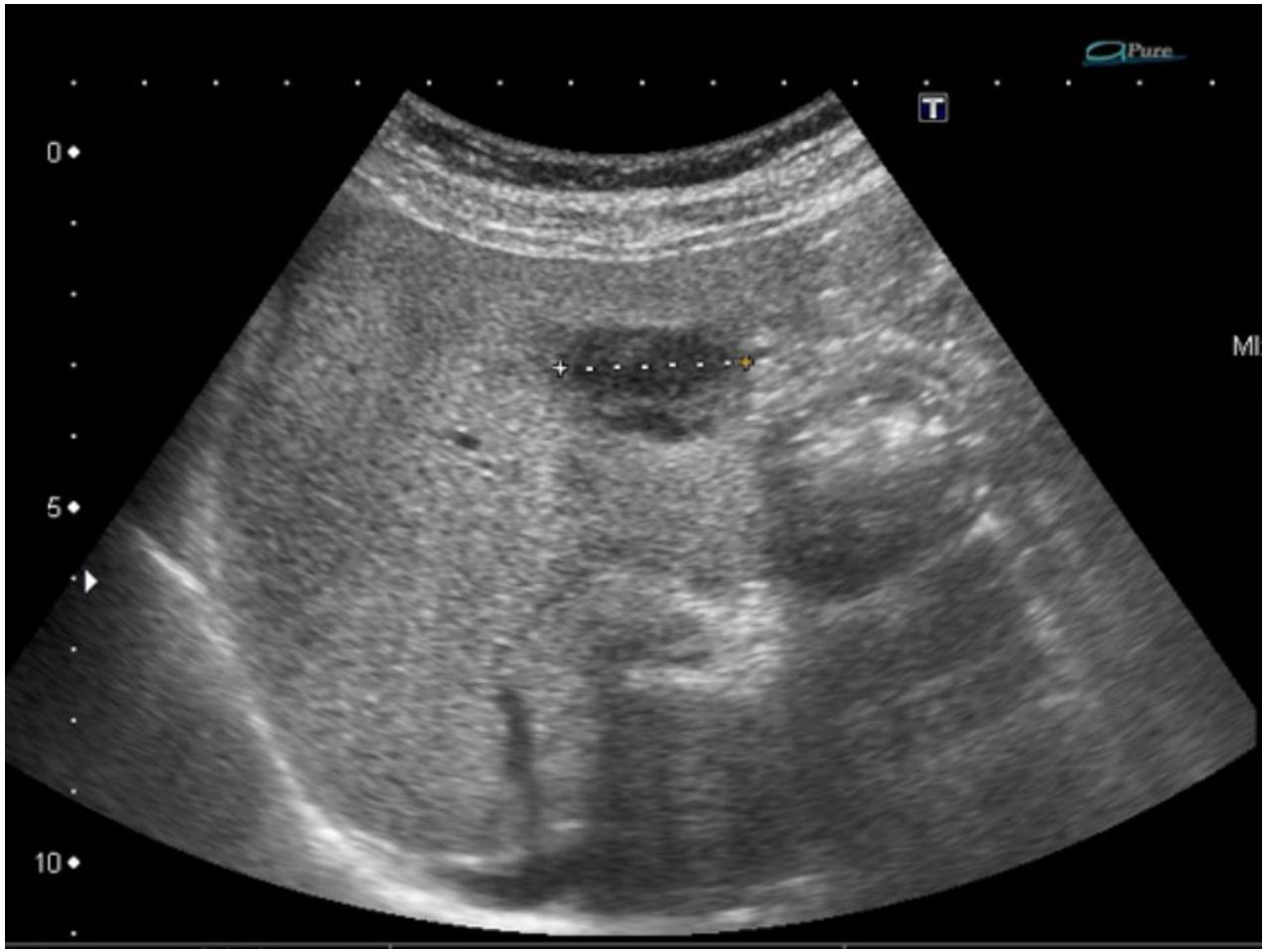
Amebic hepatic abscess

- See *Entamoeba histolytica* module for additional details.
- **Preferred:**
  - Metronidazole 750mg PO three times a day x 7-10 days as a tissue agent, followed by a luminal agent to eliminate residual colonic colonization, usually paromomycin 500mg three times a day PO x 7d.
- **Alternatives:**
  - Tissue agent: tinidazole 800mg three times a day or 2g +daily x 3-5d.
  - Luminal agents:
    - Iodoquinol 650mg three times a day x 20d
    - Diloxanide furoate 500mg three times a day x 10d
- Percutaneous aspiration has no clear role in therapy, but consider for diagnosis if uncertain (serology inconclusive or not available) or no response to appropriate antibacterial therapy.
  - Predictors of need for aspiration: include age> 55 years, abscesses > 5 cms, involvement of both lobes of liver and failure of medical therapy after 7 days.

Image Dx,(Ultrasound)

- Liver abscesses are typically **poorly demarcated** with a variable appearance, ranging from predominantly hypoechoic (with some internal echoes) to hyperechoic. Gas bubbles may also be seen [7]. Colour Doppler will demonstrate the absence of central perfusion.
- Contrast-enhanced ultrasound shows wall enhancement during arterial phase and progressive washout during portal or late phases. The liquefied necrotic area does not enhance. The use of contrast allows one to characterise the lesion, to measure the size of the necrotic area, and to depict internal septations for management purposes. In small abscesses (under 3 cm) and in highly septated abscesses, drainage is not recommended.
- In patients with monomicrobial *K. pneumoniae* abscesses
- , the lesion may appear **solid and mimic a hepatic tumour** [6].

診斷: us

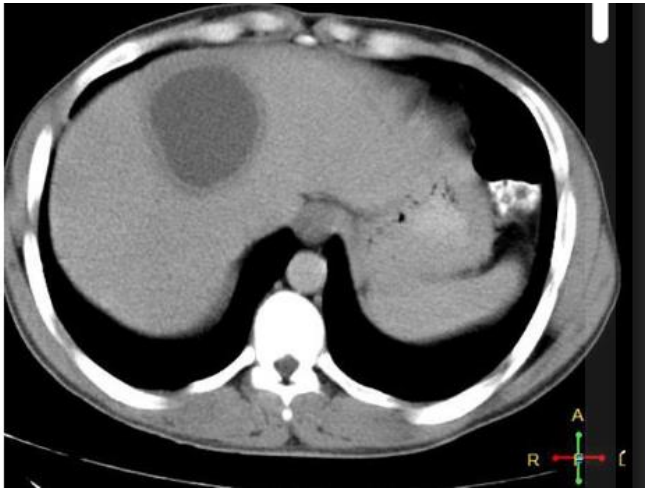


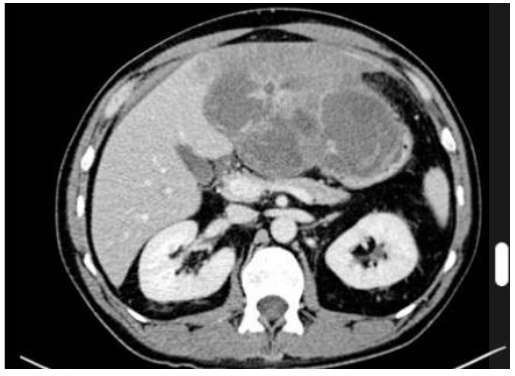
診斷:Abdominal CT

- As with other modalities, the appearance of liver abscesses on CT is variable. In general, they appear as **peripherally enhancing, centrally hypoattenuating lesions** [8]. Occasionally they appear solid or contain gas (which is seen in ~20% of cases [14]). The gas may be in form of bubbles or **air-fluid level**s [11]. Segmental, wedge-shaped or circumferential perfusion abnormalities, with early enhancement, may be seen [8, 11].
- The "**double target sign**" is a characteristic imaging feature of hepatic abscess demonstrated on contrast-enhanced CT scans, in which a **central low attenuation lesion (fluid filled) is surrounded by a high attenuation inner rim and a low attenuation outer ring [10,11].** The inner ring (abscess membrane) demonstrates early contrast enhancement which persists on delayed images, in contrast to the outer rim (oedema of the liver parenchyma) which only enhances on delayed phase [11].
- The "**cluster sign**" is a feature of pyogenic hepatic abscesses [12]. It is an aggregation of **multiple low attenuation liver l**esions in a localised area to form a solitary larger abscess cavity.

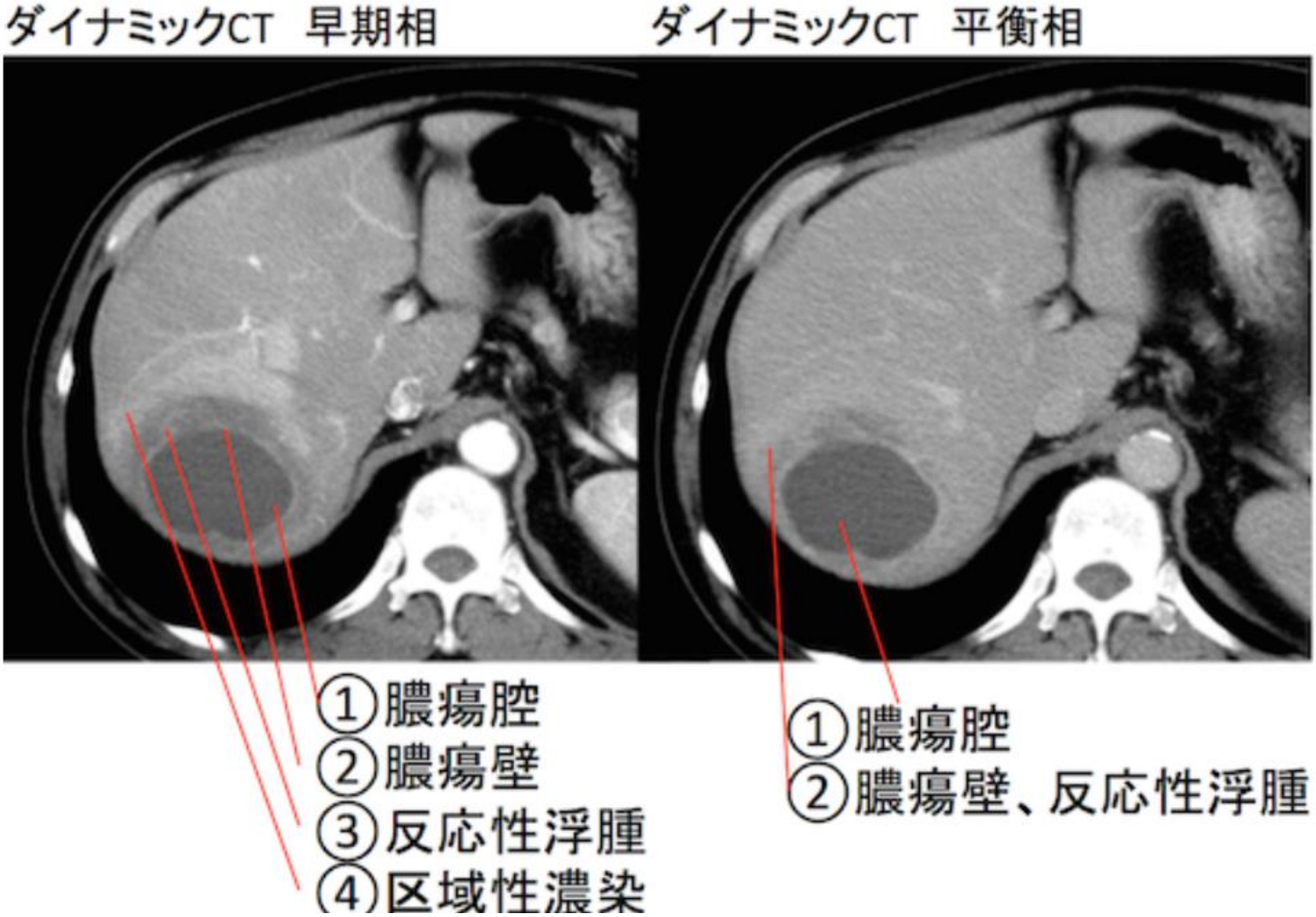
Abdominal CT

- 1. Double target sign
- 2/ Cluster sign



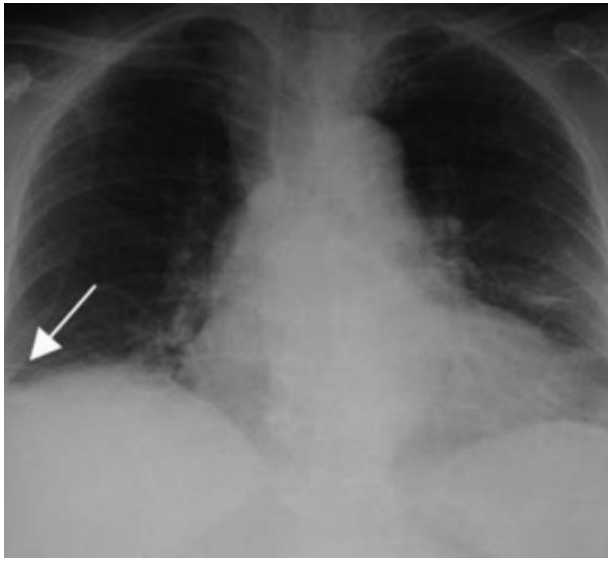


症例① 50歳代男性


ダイナミックCT　早期相
ダイナミックCT　平衡相
①膿瘍腔
②膿瘍壁
③反応性浮腫
④区域性濃染
①膿瘍腔
②膿瘍壁、反応性浮腫

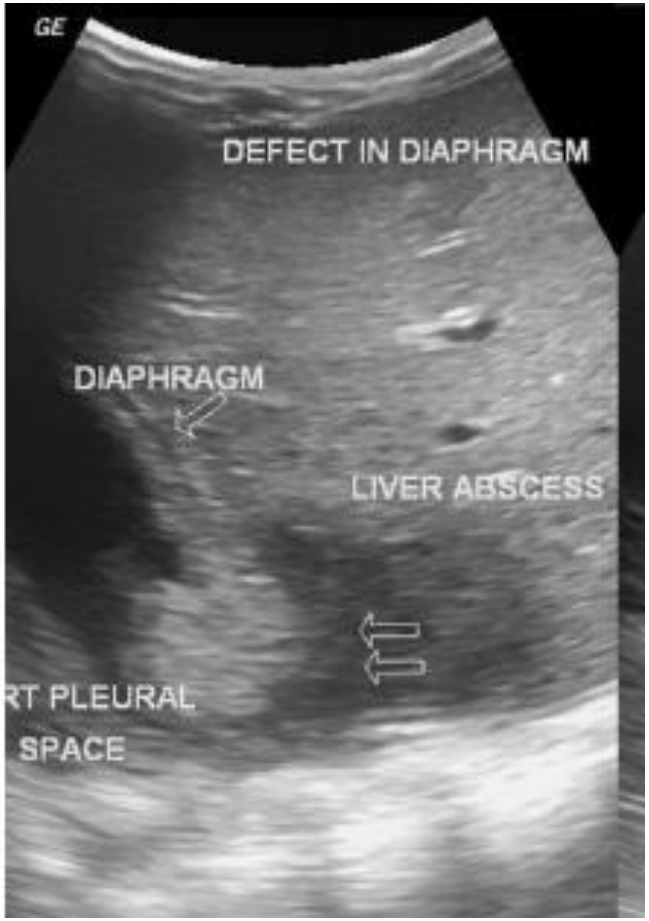
CT Diagnosis: -注意abscess的位置.

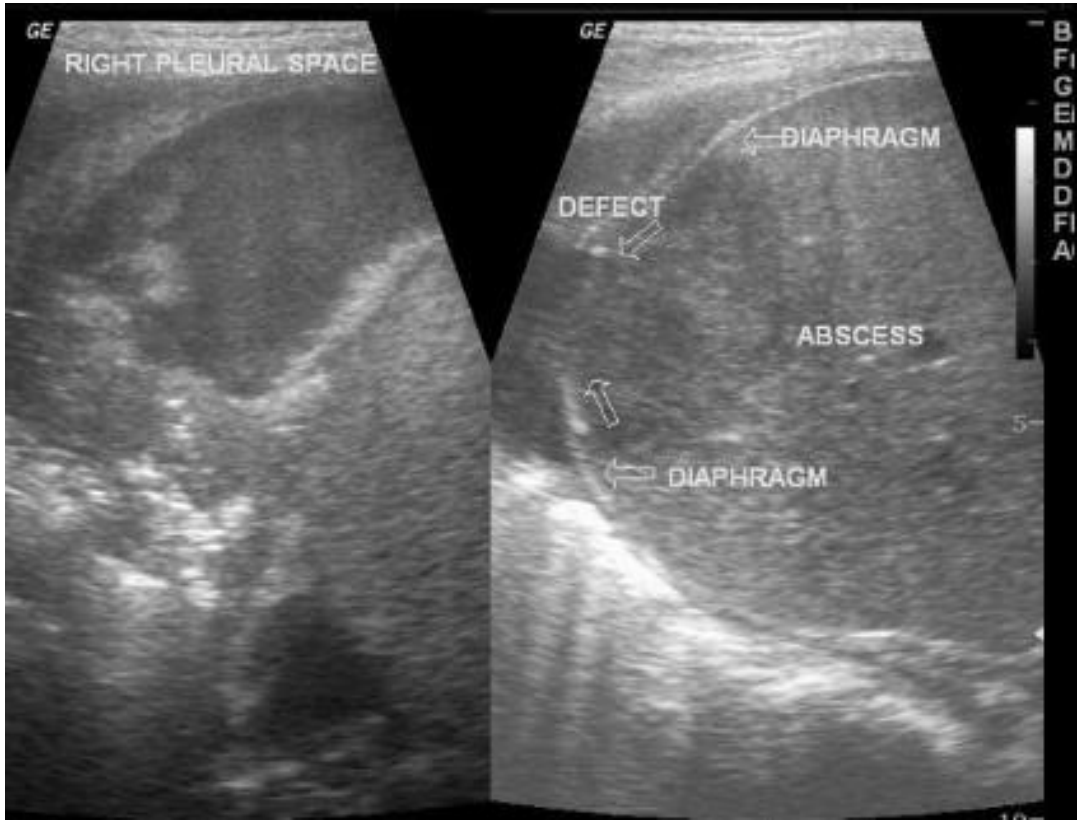
同症例の造影CT



S6 の被膜直下に膿瘍腔を認める。

Liver abscess with rupture

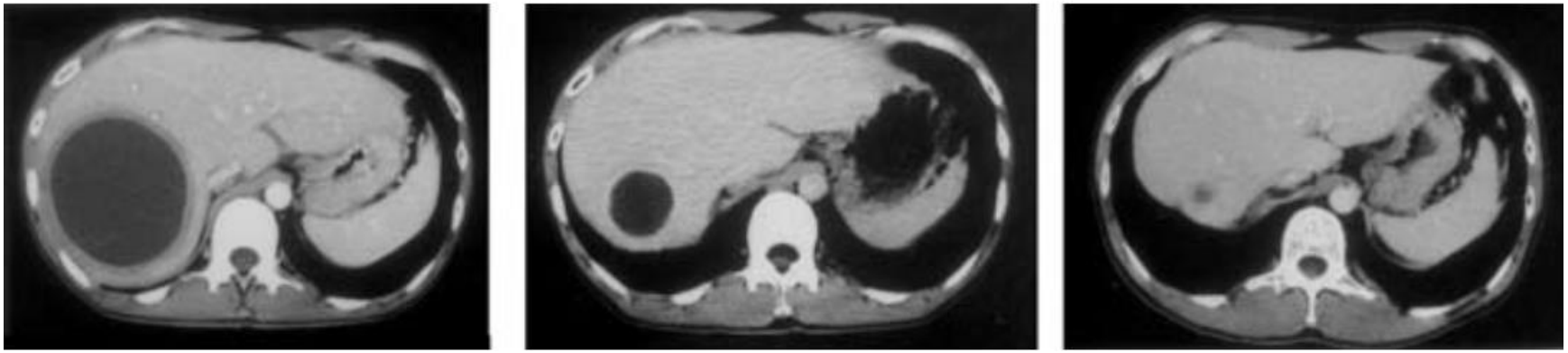




2. CT in pyogenic liver abscess
Follow up after treatment

metastatic or pyogenic liver
abscess—antibiotics 後很快消失

Amebic liver abscess before and after treatment



Left: before treatment
Middle: 3 months after treatment
R: one year later

Regular follow up of abcess q 6-12 months.

Pyogenic liver abscess
Follow up

- < 10 cm --- 16 週
- **> 10 cm.– 22 週才消失**

- 102cases in Nepal,
- Sharma D. : Eur J Radiology, 2009

Periodontitis and PLA
Dental scaling reduced PLA

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Periodontitis and dental scaling associated with pyogenic liver abscess: A population-based case-control study.

Yeh YT[1,2,3], Wang BY[4,5], Lin CW[3,6], Yang SF[7,8], Ho SW[4,5], Yeh HW[9], Huang JY[7], Chang YC[1,2,3], Yeh CB[4,5].

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1. A nationwide population-based case-control study was applied using data from the National Health Insurance Research Database in Taiwan. We identified and enrolled 691 PLA patients, who were individually matched by age and sex to 2764 Controls.
2. **Periodontitis remained a risk factor for PLA among patients aged 20-40 years, with an aOR of 2.31 (**95% confidence interval [CI] = 1.37-3.90, P = .0018). In addition, the average aOR for PLA was significantly lower among patients with
one DS (aOR = 0.76, 95% CI = 0.59-0.96) and
more than one DS (aOR = 0.61, 95% CI = 0.39-0.95) within 1 year before the index date

Note : DS: dental scaling (DS)
PLAs : pyogenic liver abscesses (PLAs).

Key-points in evaluation of PLA. 必查CRP.

- **[Pyogenic liver abscess: a retrospective patient study];** Zenouzi R, Schmiedel S, Lohse AW(Hamburg); Zeitschrift fur Gastroenterologie 50 (6), 578-84 (Jun 2012)
- .Results: 75 % of the patients were male. The mean age was 51.7 ± 16.6 years. Most of PLA (70 %) had a hepatobiliary origin. **Diabetes mellitus (25 %)** and **cholangiocarcinoma (20** %) were the major risk factors for PLA. Crohn's disease was a possible cause in at least one patient. Fever (70 %) and tachycardia (50 %) were the most common symptoms. **The C-reactive protein was elevated in all patients**. Enterococci (>40 %) and anaerobes (>20 %) were the most frequent organisms in abscess cultures, Escherichia coli (25 %) was the most frequent organism in blood cultures.

HCA and CA liver abscess

- **Characteristics of healthcare-associated and community-acquired Klebsiella pneumoniae bacteremia in Taiwan;** Wu HS, Wang FD, Tseng CP, Wu TH, Lin YT, Fung CP; Journal of Infection and Chemotherapy (Nov 2011)
- We compared the clinical characteristics of patients from the CA and HCA groups and identified the risk factors for infection-related mortality. RESULTS: In a total of **372 patients, HCA infections were observed in 44%.**
- The HCA group had higher Charlson score, the Acute Physiology and Chronic Health Evaluation, version II (APACHE II) score, frequency of malignancy, rates of respiratory tract infection and bacteremia from unknown sources, and **higher mortality** than the CA group**.**
- **Diabetes and liver abscess were predominant in the CA group.** Whereas old age, APACHE II score>15, malignancy, liver cirrhosis, chronic renal failure, respiratory tract infection, skin and soft tissue infection, and inappropriate antimicrobial therapy were predictors for mortality, HCA bacteremia was not. CONCLUSIONS: HCA bacteremia showed different characteristics and higher mortality than CA bacteremia, but HCA infection was not an independent risk factor for mortality.

HCA—health care acquired.

PLA in children.

- **Pyogenic liver abscess among children in a medical center in Central Taiwan** Yu-Lung Hsu et al (CMUH) **Journal of Microbiology, Immunology and Infection**
- Volume 48, Issue 3, June 2015, Pages 302-305

1. Fifteen patients were diagnosed with pyogenic liver abscess. Their most common symptoms were fever and abdominal pain.
2. Eight (53.0%) had leukocytosis (>15000/μL) and elevated C-reactive protein (CRP) level (>10 mg/dL).
3. single abscess in right lobe (86.7%)
4. Blood culture were mainly negative (80%)
5. ***Klebsiella pneumoniae* (6/15, 40.0%) and *Streptococcus* spp**. (6/15, 40.0%) as the two most common pathogens.
6. no mortalities.

antibiotics

- Pyogenic liver abscess : 4-6週
- 要作引流.
- Amebiasis 不必引流

CRP ratio(relative to CRP at week 1)

- **Role of C-reactive protein in response-guided therapy of pyogenic liver abscess;** Law S, Li K; European Journal of Gastroenterology and Hepatology (Sep 2013)
- From 2000 to 2011, 109 patients with PLA underwent regular monitoring of WBC, ESR, and CRP. Except for ESR, both WBC and CRP showed an initial rapid reduction in first 3 weeks, followed by a relatively slow decrease.
- **By week 3, a CRP ratio of 0.423 or** less was a marker of good outcome (sensitivity 0.846; specificity 0.667) and was also a marker of adequacy of antibiotic therapy of 5 weeks or less (sensitivity 0.786; specificity 0.714) if the ratio was 0.278 or less.
- **Weekly CRP measurement** was useful in the identification of patients with PLA with good outcome and adequacy of antibiotic therapy of 5 weeks or less.

@@@至少每週查一次 CRP., 第三週減半,第五週減為 10 %
→Normal 才可停抗生素

KP abscess : Prognosis (160 cases)

- **Mortality –11 %**
- **Relapse : 4.4 %,**
- Causes of death –18 cases
- fulminant sepsis—9
- metastatic infections –4,
- brain and lungs, meninges etc.—
- Rupture of abscess –2
- Wang JH et al :Clincal Inf Dis. 1998

Prognostic indicators in PLA

- **Mortality in Emergency Department Sepsis score as a prognostic indicator in patients with pyogenic liver abscess;** *Kuo SH, et al American Journal of Emergency Medicine (Apr 2013)*
- ***431 cases (2005-2010)***
- ***94 cases required intensive care (22 %)***
- ***63 died—15 % case fatality***
- ***Associated factors---***higher MEDS scores on admission (P<.0001) and the presence of underlying malignancy (P = .006), multiple abscesses (P = .001), anaerobic infections (P<.0001), hyperbilirubinemia (P<.0001), and higher serum creatinine levels (P<.0001) were significantly associated with PLA mortality.
- **The optimal cutoff MEDS value of 7** or higher had a sensitivity of 76% sensitivity and a specificity of 81%, with a 10.7-fold PLA mortality risk (P<.0001) and a 26.2-fold intensive care unit admission risk (P<.0001).
- CONCLUSIONS: The MEDS scores on admission represent a significant prognostic

Mortality in Emergency Department Sepsis (MEDS) score

PREDISPOSITION	
age ≥ 65 years	☐
nursing home resident	☐
rapidly terminal comorbid illness[1]	☐
INFECTION	
lower respiratory infection	☐
RESPONSE	
bands > 5%	☐
ORGAN DYSFUNCTION	
respiratory rate > 20 *or* pulse oximetry < 90%	☐
septic shock[2]	☐
platelet count < 150,000/μL	☐
altered mental status	☐

Age >=65---- --3x
Nursing home resident ---2x
Terminal disease – 6x

Lower respiratory tract infection----------2x

.5 % band ----------3X

RR >20/min.
Pulse oximetry <90 % ------3X
Septic shick ----------3X
Platelet <150,000----------3X
Altered mental status-------2X

SUM ----------27 X

Follow up.
小心 Recurrence

FOLLOW-UP

- If untreated, mortality rate associated with pyogenic hepatic abscess approaches 100%.
- With treatment, in some series, mortality is below 15%; the latter mortality is dependent upon underlying disease.
- Recurrence is more frequent after simple percutaneous aspiration without placement of a temporary drain, or in patients in whom drains are removed too early.

Summary-1

- 1. Klebsiella pneumoniae primary liver abscess (KLA) occurs in the absence of hepatobiliary disease and is almost always monomicrobial. Most cases have been reported from Asia or in patients of Asian origin.
- 2. Diabetes mellitus or impaired fasting glucose is the most important host risk factor for primary KLA.
- 3. In addition to the manifestations typical of pyogenic liver abscess, such as fever, leukocytosis, right upper quadrant tenderness, and elevated liver enzymes, a minority of patients with primary KLA can develop metastatic infections at other sites. The most common sites for metastatic infections are the eye, meninges, and brain.

Summary-2

- 4. Imaging should be performed in patients with signs and symptoms of a liver abscess or in patients with Klebsiella pneumonia bacteremia who have persistent fevers despite appropriate antibiotic therapy. Diagnosis of primary KLA is made by detection of a liver abscess on imaging (ultrasound or computed tomography [CT]) followed by aspiration of the lesion for Gram stain and aerobic and anaerobic culture.
- 5. Treatment of KLA requires parenteral antibiotic therapy in addition to drainage, optimally percutaneous. Antibiotic choice should be based upon the results of antibiotic susceptibility testing. A third-generation cephalosporin is preferable if the isolate is susceptible and cost is not prohibitive. Antibiotics should be given for at least four to six weeks, depending on abscess resolution as determined by imaging findings.
- 6. The reported mortality rate has ranged **from 4 to 11 percent**. Metastatic disease to the eyes or brain can cause significant long-term morbidity

Key points in liver abscess.(結論)

Key points

- A liver abscess is a pus-filled cavity within the liver, usually caused by a biliary tract source; occasionally, multiple cavities are seen
- Origin may be pyogenic, amebic, or (rarely, and usually in severely immunocompromised patients) fungal
- Clinical presentation is with fever and abdominal pain but is frequently nonspecific, without localized right upper quadrant symptoms
- Computed tomography (CT), both with and without intravenous and oral contrast, and ultrasound are the imaging studies of choice
- Treatment involves antimicrobial therapy with or without percutaneous or surgical drainage
- Liver abscess is almost uniformly fatal if left untreated. Timely treatment reduces mortality to 5% to 30%

- Duration at least 2 weeks of IV therapy
- F/b Oral treatment for 6 weeks
- Step down to specific antibiotics after culture & sensitivity report
- Treatment of ALA is Metronidazole x 7 days f/b oral Diloxanide furoate x 10 days