SUBPHRENIC SUPPURATIONS

ESSAY

SUBMITTED IN PARTIAL FULFILMENT

FOR THE MASTER DEGREE IN GENERAL SURGERY

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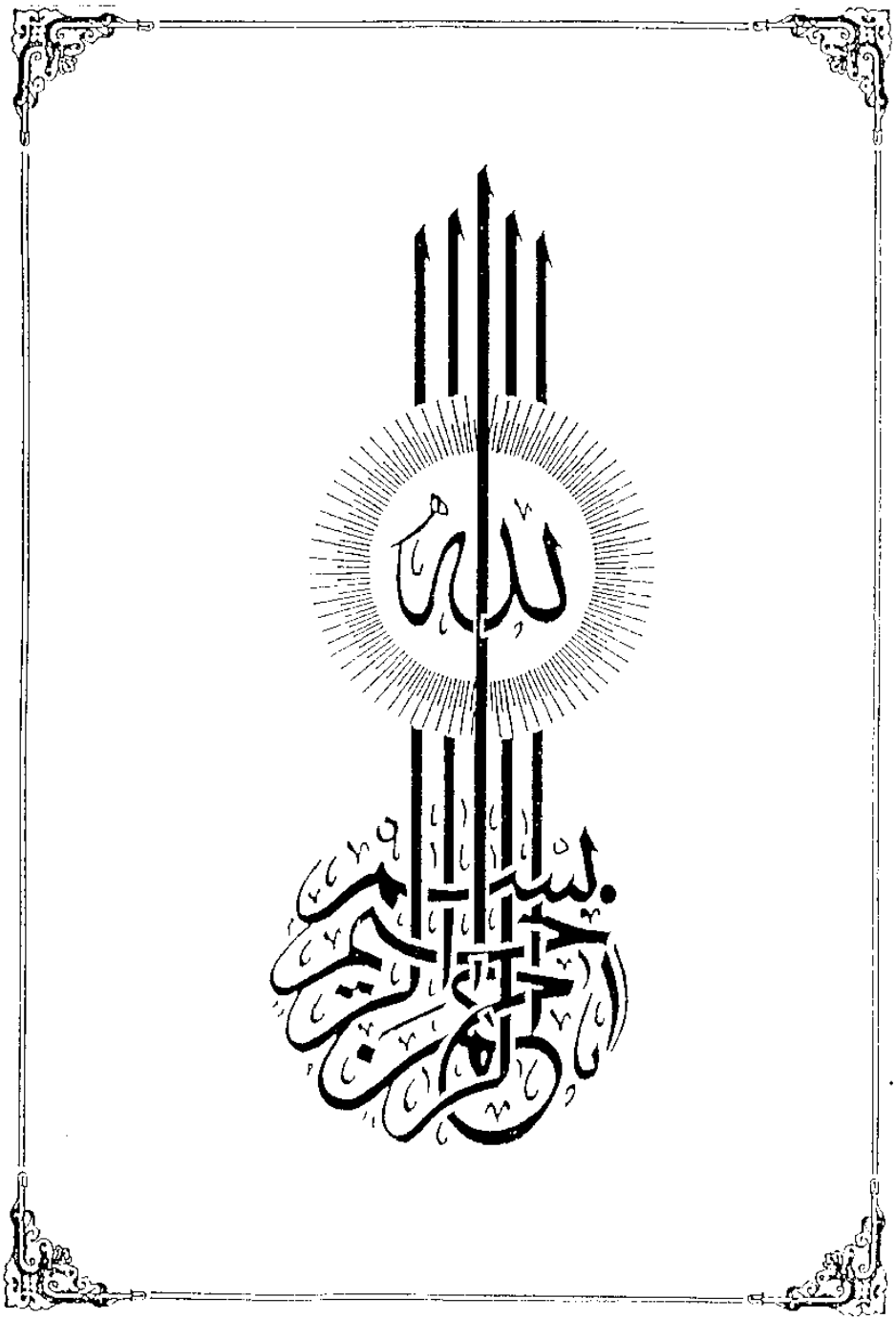

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INTRODUCTION

Subphenic infection is a not uncommon occurance, which may progress to abscess formation.

One should always bear in mind the old adage "pus somewhere, pus nowhere else, pus under the diaphragm"

In spite of recent advances in methods of diagnosis and improved antibiotics, subphrenic abscess continues to manifest significant mortality and morbidity figures.

Of all the complications of intra-abdominal surgery, it continues to be a hazard to the patient and an enigma to the surgeon.

The purpese of this study is to discuss in full details the different types of subphrenic suppurations, their causes, complications and recent methods in management and prophylaxis.

Part I

CHAPTER 1

ANATOMY OF SUBPHRENIC SPACES

Historical Review

The First classical description of subphrenic abscess was made by Barlow, 1845 who defined it as "a localised infection that at some point is in contact with the under surface of the diaphragm". Martinet, 1898 ; Piquands, 1909 & Barnard, 1908 have especially worked out the topographical anatomy of the subphrenic region.

Martinet, 1898 divided this region into six spaces:-

Two inter-hepato-diaphragmatic spaces located between the upper surface of the liver and the diaphragm, one on each side of the midline, a subhepatic space located on the under surface of the liver to the right of the hepatoduodenal ligament, an inter-hepatogastric space located beneath the liver and anterior to the lesser omentum, a retrogastric space located posterior to the lesser omentum and a peri-splenic space located around the spleen.

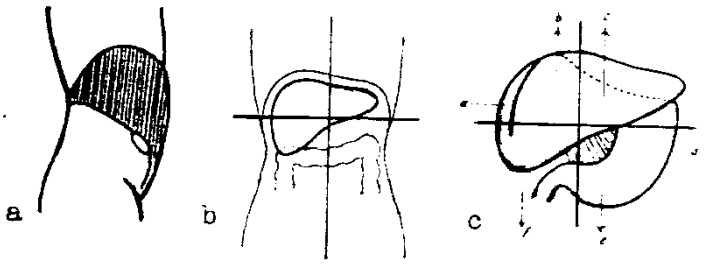
The classification according to Barnard is similar. He described on the right side an anterior subphrenic space located between the liver and diaphragm and a posterior subphrenic space (Rutherford-Morrison's pouch) in the subhepatic pouch on the under surface of the liver, on the left side a perigastric space anterior to the lesser omentum, a perisplenic and a space in the "small sac of the peritoneum". i.e. he described four intraperitoneal spaces :-
"right anterior, right posterior, left anterior, left posterior" and two extraperitoneal cellular ones "right and left".

It has long been taken for granted that there are two suprahepatic spaces on the right side, this was Barnard's hypothesis, and has been supported by "Nather & Ochsner, 1923 ; Clairmont, 1926 ; McGregor, 1932 ; Ochsner and Craves, 1933 & by Thorek, 1947.", Figs. (1 , 2).

However, Mitchell, 1940 clearly points out that the posterior suprahepatic space is really Morrison's pouch" a postero-superior cul-de-sac of the right subhepatic space". This was supported by Harley, 1949.

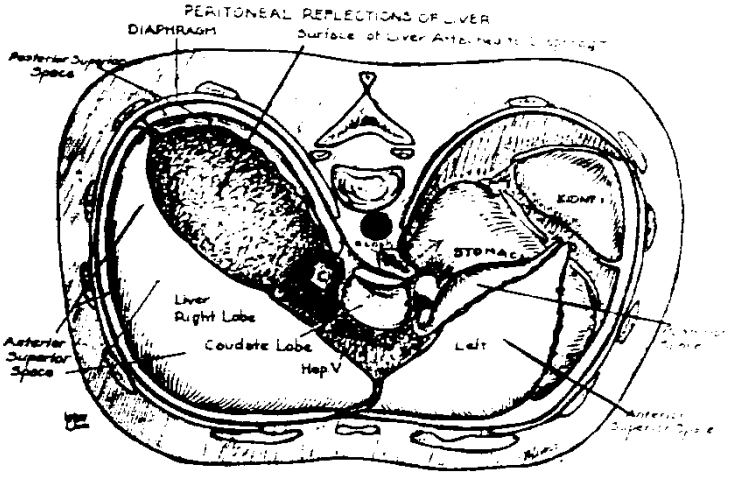
Boyd pointed out in 1958 that the right coronary ligament does not insert superiorly but surrounds the bare area posteriorly like all other intraperitoneal viscera. Thus the so called right posterosuperior

Fig.1
(Nather & Ochsner,1923)



a.Boundaries of the surgical subphrenic region.
b.Division into the four main spaces.
c.The transverse line on the upper surface of the liver represents the coronary lig. a,Rt.Upper Post.Space;b,Rt.Up.Ant.Space;c,Lt.Up.Space;d,Lt. Lower Post.Space(Lesser Sac);e,Lt.L.Ant.Space;f, Rt.L.Space.

Fig.2
(Boyd,1958)



The old anatomical classification of suphrenic spaces

subphrenic space is a myth. It does not exist, and the actual right subphrenic ligament extends much further back than was previously thought and the space below the inferior reflection of the right coronary lig. is in the back of and below the visceral surface of the liver. Fig. (3).

However excellent Boyd's contribution was for the right side of the liver's attachment, he overdid it on the left where he stated that the triangular lig. was also posterior ; this is wrong, as Wooler, 1956 in England pointed out "the left triangular lig. is situated medially, almost in the center of the abdomen, and more anteriorly than the right coronary and triangular lig. It is a superior attachment of the liver, whereas the right triangular and coronary lig. are posterior attachment of the liver". Fig. (4).

Thus Boyd simplified the anatomy into four spaces ;

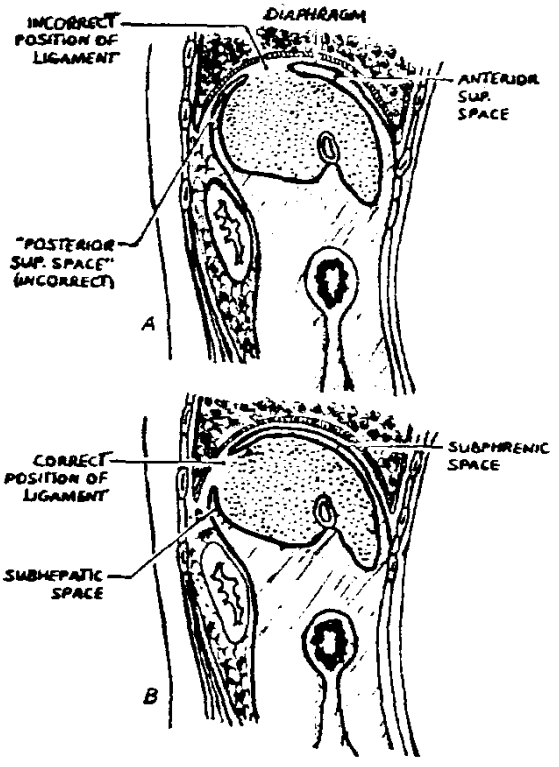
1) Right antero-superior subphrenic space.

2) Right postero-inferior subhepatic and retrohepatic space (Morrison's pouch).

Boyd noted that these spaces are large and that characterisitically they become subdivided about their midpoint by the formation of pyogenic membranes, thus forming either anterior or posterior subphrenic or subhepatic abscesses.

Fig.3

(Schwartz,1979)



The correct position of the Rt. coronary and triangular lig.

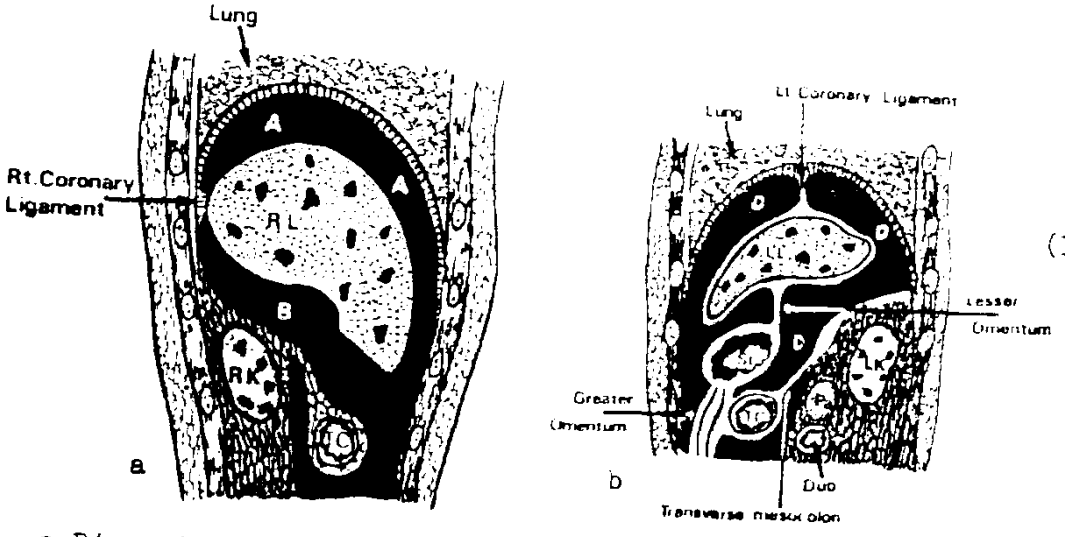


Fig.4

(Fataar,1981)

a.Rt. subphrenic spaces; A=suprahepatic space,B=subhepatic space . b.Lt. subphrenic spaces;C=Lt.subphrenic space, D=Lesser sac.

3) Left combined subphrenic and subhepatic space.

4) One further subhepatic space which is the lesser sac.

Moore, 1963 added that the subhepatic area to the right is an abdominal and not a subphrenic area, and that the hepatic areas to the left are, for practical purposes, abdominal and not covered by the ribs. This distinction is important, for the suprahepatic abscess is primarly a thoracic entity and its signs both physical and radiological will be intrathoracic. It is important for treatment also because the suprahepatic abscess is most easily drained by transthoracic route while a subhepatic abscess is best drained abdominally.

Ariel & Kazarian, 1971 & Halliday, 1976 showed that the bare area is more truely dorsal so that there are, right superior subphrenic, right subhepatic, left perihepatic subphrenic and left subhepatic (the lesser sac) intraperitoneal spaces.

It is important to realize that these are potential spaces, and although anatomists may define clear boundaries, suppuration has no respect for anatomic boundaries or terms.

Recent Anatomical Classification

The subphrenic region is considerd to be that portion of the abdominal cavity which extends from the diaphragm above to the transverse colon and mesocolon below. The region is divided into suprahepatic and infrahepatic compartment by the liver. The suprahepatic compartments is subdivided into right and left portions by the falciform lig. and the infrahepatic compartment is similarly subdivided by the ligamentum teres and ligamentum venosum.

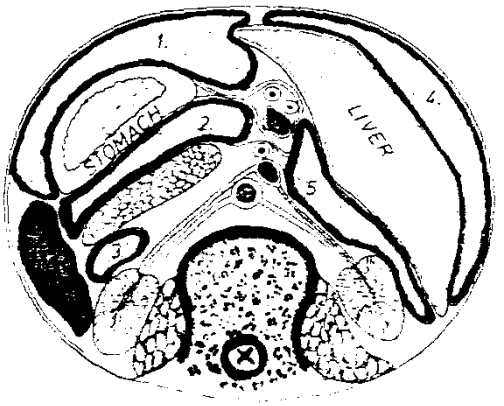
There are five intraperitoneal spaces Figs. (5 & 6) two on the right side, three on the left side and two extra peritoneal spaces one on each side.

The Intraperitoneal Spaces :

1) Right Suprahepatic Space

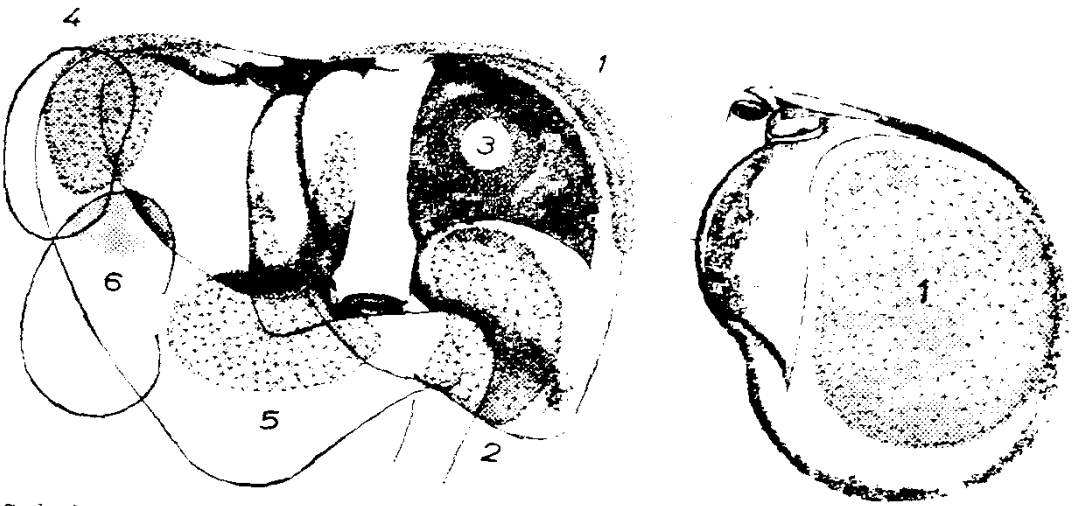
It lies between the right leaf of the diaphragm and the superior, anterior, and right surfaces of the right lobe of the liver. It is limited medially by the falciform lig. which separates it from the left suprahepatic space, and posteriorly by the superior layer of the coronary and right triangular ligaments, which separate it from the right extraperitoneal space.

Fig.5
(Staurt,1975)



Subphrenic spaces in relation to the liver and stomach

Fig.6
(Halliday,1976)



Subphrenic abscesses in relation to the dorsal aspect of the liver. 1,Rt.sup.subphrenic; 2,Rt.subhepatic ; 3,Rt.extraperitoneal; 4,Lt."perihepatic"subphrenic ; 5,Lt.subhepatic(Lesser sac); 6,Lt.extraperitoneal(perinephric).

2) Right Infrahepatic Space (Hepato Renal Pouch-Morrison's pouch).

It is bounded above and in front by the right lobe of the liver and gallbladder. Below and behind are the upper pole of the right Kidney, the lower part of the right suprarenal gland, the second part of the duodenum, a part of the head of the pancreas, and the right colic flexure and right extremity of the transverse colon and mesocolon, while lateral to the kidney is the diaphragm. It is limited medially by hepatoduodenal lig. and ligamentum teres. Its postero-superior extremity projects upward and backward between the liver and the kidney and suprarenal gland medially, and the diaphragm more laterally, and is regarded by Mitchell, 1940 as retrohepatic recess of the space.

This space opens medially into the lesser sac via the foramen of Winslow. Both spaces are related infero-laterally to the right paracolic gutter (PCG).

3) Left Suprahepatic Space

It is limited medially by the falciform lig., and posteriorly, in its medial portion, by the left triangular lig. lateral to this lig., the space extends backward between the diaphragm and spleen, and then inward between the kidney and spleen to the lienorenal