Histopathological Study of Hepatocellular Carcinoma

Thesis

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Pathology

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ABSTRACT

This work aimed an accurate survey of HCC cases received by pathology departments in both Kasr Al Ainy hospital and TBRI during a period of 5 years (2004-2008).

Most of the studied cases of HCC were diagnosed through core liver biopsy which represents most of cases collected at Kasr El-Einy hospital, while cases collected from TBRI were mostly through surgical resection. The percentage of resection specimens were increased annually in the studied period

Patients' age ranged from 21 to 83 years with mean age of 53.83 years and median 55 years. The commonest age group was from 50 to less than 60 years

Prevalence of HCC in patients older than 40 years was about 7.7 times those 40 years old or younger

Key Words:

Anatomy of liver, Histology of liver, Liver cancer, Hepatocellular carcinoma

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Ranya Abdel Rahman Al Ashiry

List of abbreviations

AFB1	Aflatoxin B1
AFM1	Aflatoxin M1
AFP	Alpha fetoprotein
ALT	Serum alanine aminotransferase
AT	Ataxia-telangiectasia
BMI	Body mass index
CC	Cryptogenic cirrhosis
CCC	Cholangiocellular carcinoma
CT	Computerized tomography
DN	Dysplastic nodule
DNA	Deoxyribonucleic acid
FLHCC	Fibrolamellar hepatocellular carcinoma
FNAB	Fine needle aspiration biopsy
FNH	Focal nodular hyperplasia
GFAP	Glial fibrillary acid protein
GPC3	Glypican-3
H&E	Hematoxylin and eosin stain
HBsAg	Hepatitis-B-Virus surface antigen
HBV	Hepatitis B virus
HCC	Hepatocellular carcinoma
HCV	Hepatitis C virus
Hep Par 1	Hepatocyte Paraffin 1 antibody
HIV	Human immunodeficiency virus
HMB-45	Human melanoma black 45
HVD	Hepatic vena cava disease
IARC	International Agency for Research on Cancer
IM	Intrahepatic metastasis
ISH	In situ hybridization
MECC	Middle East Cancer Consortium
MMP-7	Matrix metalloproteinase-7
MO	Multicentric occurrence
MRI	Magnetic resonance imaging
MRN	Macroregenerative nodule
NAFLD	Non-alcoholic fatty liver disease
NASH	Non-alcoholic steatohepatitis

NCI	National Cancer Institute of Egypt
PAS	Periodic acid-schiff
PAS-D	Periodic acid-Schiff stain with diastase
SEER	Surveillance Epidemiology and End Results
SHCC	Scirrhous hepatocellular carcinoma
TBRI	Theodor Bilharz Research Institute
TTF-1	Thyroid transcription factor-1
USA, US	United States of America
WHO	World health organization

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INTRODUCTION

Hepatocellular carcinoma (HCC) has become one of the most common cancers worldwide, being ranked as the 5th cancer in the classification of all malignancies ***(Parkin et al., 2002).***

The geographic prevalence of HCC varies considerably in different countries. Areas with a very high incidence include Southeast Asia, sub-Saharan Africa and the western coast of Africa. However, a low incidence is found in the United States, Canada and Australia ***(Ferlay et al., 2004).***

The epidemiologic varieties in the prevalence of HCC have been attributed to the differences in the prevalence of risk factors which are mainly hepatitis C and hepatitis B viruses ***(Montalto et al., 2002).***

The first Population-based Cancer Registry in Egypt ***(1999),*** showed that HCC accounts for 13% of all cancers in males and is ranked as the second most frequent cancer for males ***(Ibrahim et al., 2002).***

The hospital based cancer registry helps in improving patient care, enhancing professional & administrative education and encouraging clinical research ***(Abdel Bar et al., 2002).***

AIM OF THE WORK

Selection of all available archival material of histologically documented cases of hepatocellular carcinoma received at the pathology departments of Kasr El-Einy Hospital and Theodor Bilharz Research Institute (TBRI) during a period of 5 years (2004-2008).

Revision of all available cases and reclassification according to the latest WHO grading system ***(2000).***

Statistical evaluation and correlation between clinical patients' data available in the request sheets and pathological findings.

REVIEW OF LITERATURE

Anatomy of Liver

The liver is the largest internal organ, representing 2-3% of the total body weight in an adult. It occupies the right upper quadrant of the abdomen, surrounding the inferior vena cava, and attaches to the diaphragm and parietal peritoneum by various attachments that are commonly referred to as ligaments ***(Axelrod and Leeuwen, 2008).***

The liver is nourished by a dual blood supply, approximately three-fourths via the portal vein and the remainder via the hepatic arteries. The portal vein carries venous blood from the alimentary tract, including the pancreas, which is rich in nutrients; whereas the hepatic artery supplies arterial blood from the celiac axis that is rich in oxygen for liver survival. Venous outflow is provided by 3 large hepatic veins that enter the inferior vena cava. In addition, there are short venous segments that drain the posterior surface of the liver directly into the inferior vena cava ***(Suriawinata and Thung, 2007).*** The hepatic artery supplies 30% of the blood flow to the normal liver parenchyma but greater than 90% to hepatic tumors, including both HCC and metastatic lesions ***(Axelrod and Leeuwen, 2008).***

The liver classically has been divided into left and right lobes by the location of the falciform ligament. Because this location dose not correspond to the internal subdivisions of the liver, a more functional nomenclature was developed by Hjortso ***(1951)*** and Couinaud ***(1957)*** on the basis of the distribution of vessels and ducts within the liver. In this nomenclature, a line

connecting the gallbladder fossa and the inferior vena cava (Cantlie's line) demarcates the right and left hemilivers, each with independent vascular and duct supplies. The liver can be divided further into eight segments, each containing a pedicle of portal vessels and ducts and drained by hepatic veins ***(Wanless, 2006).***

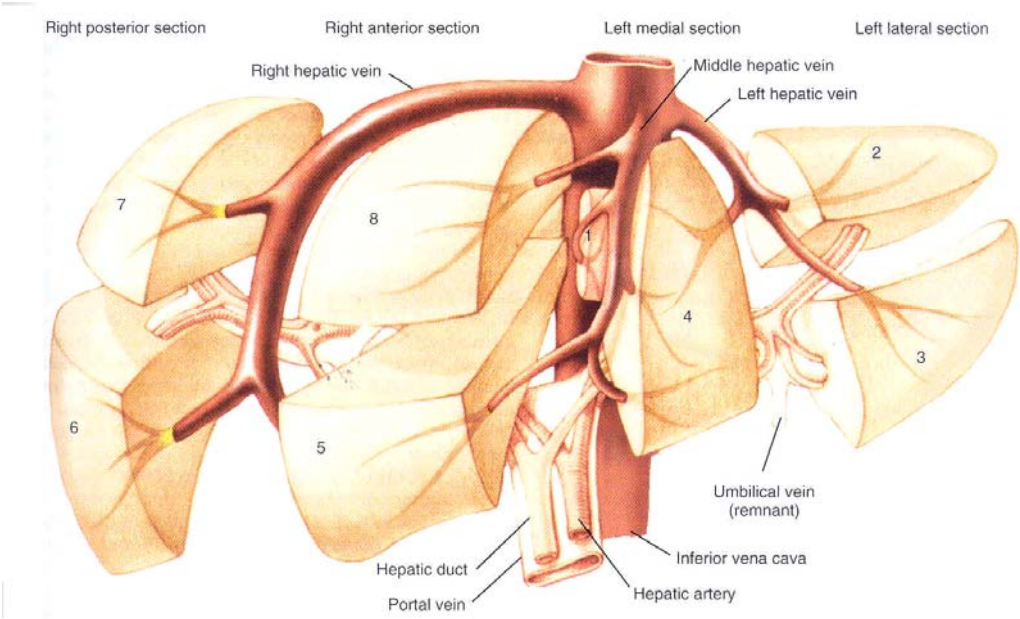

Figure (1): Diagram of the functional segments using the nomenclature of Couinaud ***(Wanless, 2006).***

In general, resection of the liver is divided into 2 main categories. Nonanatomic (wedge) resections are generally limited resections of a small portion of liver without respect to the vascular supply. Anatomic resections involve removing 1 or more of the 8 segments of the liver. Commonly, a right hepatic lobectomy refers to the removal of segments 5-8, an extended right lobectomy (right trisegmentectomy) includes segments 4-8, a left