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Anesthetic Considerations For Radiofrequency Ablation of Hepatoma

Essay

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Mohamed Abd El Hamed

Contents

List of Abbreviations

ALT	**:** Alanine Transaminase
ALP	**:** Alkaline Phosphatase
AST	**:** Aspartate Transaminase
BCLC	**:** The Barcelona Clinic Liver Cancer
CBC	**:** Complete Blood Count
CT	**:** Computerized Tomography
CTP	**:** The Child-Turcotte-Pugh Score
DD	**:** Differential Diagnosis
DDAVP	**:** Diamino-8-D-Arginine Vasopressin
FFP	**:** Fresh-Frozen Plasma
FIO_2	**:** Fraction Of Inspired Oxygen
HBV	**:** Hepaitits B
HCC	**:** Hepatocellular Carcinoma
HCV	**:** Hepaitits C
PPH	**:** Porto-Pulmonary Hypertension
HPS	**:** Hepato-Pulmonary Syndrome
HR	**:** Heart Rate
HRS	**:** Hepato-Renal Syndrome
ICU	**:** The Intensive Care Unit
IV	**:** Intravenous
MAP	**:** Mean Arterial Pressure
MELD	**:** The Model For End-Stage Liver Disease Score
MG/DL	**:** Milligrams Per Deciliter
MRI	**:** Magnetic Resonance Imaging
NK	**:** Natural Killer Cells
NKCC	**:** Natural Killer Cell Cytotoxicity

NMBA	**:** Neuromuscular Blocking Agent
$PACO_2$	**:** Partial Pressure Of Arterial Carbon Dioxide
PAO_2	**:** Partial Pressure Of Alveolar Oxygen
PATM	**:** Atmospheric Pressure
PBC	**:** Primary Biliary Cirrhosis
PEEP	**:** Positive End-Expiratory Pressure
PH_2O	**:** Partial Pressure Of Water Vapor At Body Temperature
PONV	**:** Post Operative Nausea And Vomiting
PSC	**:** Primary Sclerosing Cholangitis
RFA	**:** Radiofrequency Ablation
Γ-GT	**:** Γ-Glutamyltranspeptidase
TACE	**:** Transarterial Chemoembolization
US	**:** Ultrasound
VLDL	**:** Very Low Density Lipoproteins
WHO	**:** The World Health Organization

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Introduction

Introduction

Hepatocellular carcinoma (HCC) accounts for most liver cancers. This type of cancer occurs more in men than women and is usually seen in people aged 50 or older. The disease is more common in Africa and Asia than in North or South America and Europe. In most cases, the cause of liver cancer is usually scarring of the liver (cirrhosis) which may be caused by: alcohol abuse, autoimmune diseases of the liver, hepatitis B or C virus infection, chronic inflammation of the liver or hemochromatosis. Patients with hepatitis B or C are at risk for liver cancer, even if they have not developed cirrhosis **(Roberts, 2011).**

Patients generally present with symptoms of advancing cirrhosis in the form of pruritis, jaundice, splenomegaly, variceal bleeding, cachexia, increasing abdominal girth (portal vein occlusion by thrombus with rapid development of ascites) , hepatic encephalopathy, right upper quadrant pain, hepatomegaly, Dupuytren contracture, spider angiomata, periumbilical collateral veins and enlarged hemorrhoidal veins **(Yasui et al, 2011).**

Although the mainstay of therapy is surgical resection, the majority of patients are not eligible because of tumor extent or underlying liver dysfunction. Several other treatment modalities are available, including: liver transplantation, radiofrequency ablation (RFA), percutaneous ethanol or acetic acid ablation**(Vanthey et al, 2010).**

RFA is an exciting approach to destroy inoperable primary or metastatic tumors in the liver. In the treatment of HCC, less than 40% of patients are candidates for surgery, and the rate of recurrence after curative surgery is high. Percutaneous techniques like RFA are, therefore, very important. RFA serves as a bridge for transplant candidates. RFA is a minimally invasive, repeatable procedure with few complications. It is

performed under radiological guidance. Randomized controlled trials have shown that RFA is superior to ethanol injection in the treatment of small HCC. RFA results in a higher rate of complete necrosis and requires fewer treatment sessions than ‘percutaneous ethanol injection (PET). Long-term survival rates are also better with RFA **(Ansari and Anderson, 2012).**

Chronic or end stage liver disease is associated with an increased risk of perioperative morbidity and mortality. It is essential to preoperatively assess possible hepatic encephalopathy, pleural effusions, hepatopulmonary syndrome, pulmonary hypertension, hepatorenal syndrome, cirrhotic cardiomyopathy, and coagulation disorders. The application of two, scoring systems, that is, Child-Turcotte-Pugh and model for end stage liver disease, helps to estimate the risk of surgery **(Hoetzel et al., 2012).**

Aim of work

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The purpose of this work is to focus on recent literature about anesthetic considerations for radiofrequency ablation of hepatoma and risk profiles in this setting are presented.

Chapter (I) :
Physiology of The Liver

PHYSIOLOGY OF THE LIVER

The liver, the largest gland in the body, has many complex functions, including those listed in the following table:

Table (1-1):The liver functions**(Guyton and Hall, 2014).**

•Formation of bile.
•Carbohydrate storage and release.
•protein metabolism.
•Fat metabolism.
•Cholesterol metabolism.
•Manufacture of plasma protein.
•Inactivation of some polypeptide hormones.
•Reduction & conjugations of adrenocortical & gonadal steroid hormones.
•Synthesis of 25 hydroxycholecalciferol (Vit D).
•Detoxification of many drugs and toxins

1) Bile formation:

Bile is made up of bile salts, bile pigments, cholesterol and inorganic salts dissolved in an alkaline solution that resemble pancreatic juice. Some of the components of bile are reabsorbed in the intestine and then excreted again by liver (enterohepatic circulation)**(Johnson et al,2004).**

The bile salts are sodium salts of bile acids conjugated to glycine and taurins, a derivative of cysteine. Bile acids have an important hydrotropic effect where they reduce the surface tension of fat and in conjugation with phospholipids and monoglycerides are responsible for the solubilization of