THE ROLE OF RADIOFREQUENCY ABLATION IN MANAGEMENT OF HYPERSPLENISM

Essay

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ABSTRACT

The splenic and portal venous flows decreased, but hepatic arterial flow (HAF) increased dramatically after the RFA procedure. Liver volumes at 3 month post-RFA increased compared to the baseline volumes.

KEY WORDS

ROLE

RADIOFREQUENCY

MANAGEMENT

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LIST OF ABBREVIATIONS

- **ALT** : Alanine aminotansferase.
- **AST** : Aspartate aminotransferase.
- **B thalassemia** : Beta thalassemia.
- **CECT** :Contrast enhanced computed tomography.
- **CT** :Computed Tomography.
- **HAF** : hepatic arterial flow.
- **HCC** : hepatocellular carcinoma.
- **H.Spherocytosis**: Hereditary spherocytosis.
- **HS** : Hypersplenism.
- **HSS** : Hepato-splenic schistosomiasis.
- **IVC** : Inferior vena cava.
- **MRI** : Magnetic Resonance Imaging
- **P.HTN**: Portal Hypertension.
- **PLT** : platelets.
- **PSE** :Partial splenic embolization.
- **PV** : Polycythemia rubra vera.
- **PVF** : portal venous flow.
- **RA** : Rheumatoid arthritis.
- **RBCs** : Red blood cells.
- **RFA** : Radiofrequency ablation.
- **S.C.** : Sickle cell.
- **SLE** : Systemic lupus erythematosis.
- **SMA** : superior mesenteric artery.
- **SMG** : Splenomegaly.
- **SVF** : Splenic venous flow.
- **TB** : Tuberculosis.

- **Tc99m** : Technitium 99 m.
- **US** :Ultrasonography
- **W** : Watt
- **WBCs** : white blood cells.
- **3D CT** : three dimensional computed tomography.

Introduction

The spleen is an important component of the body's defenses against infection and the adverse consequences of its removal have become increasingly apparent over the last four to five decades**. (*Dimitris et al ., 2006)***

Hypersplenism is one of the common medical problems, 70-80 % patients with cirrhotic liver and portal hypertension present with various degrees of splenomegaly and hypersplenism. The immune function in patients with hypersplenism would be reduced due to leucopenia, thrombocytopenia and erythropenia.

Splenectomy is the traditional treatment for hypersplenism However, patients with cirrhotic splenomegaly and hypersplenism often have many complications, which are the contraindication of splenectomy. ***(Quanda et al ., 2005)***

Several minimally invasive treatment modalities such as transcatheter selective splenic arterial embolization, absolute alcohol or ethanolamine oleate intrasplenic injection have been investigated clinically, but the clinical applications were restricted due to associated complications. ***(Quanda et al ., 2008)***.

Splenic artery embolization, was used for the management of hypersplenism but was later found to be associated with severe complications, such as splenic abscess, fatal pneumonia, sepsis, pancreatic and hepatic infarction, and even death ***(Palsson B. et al., 2003).***

This procedure was then modified to be partial splenic embolization (PSE), which was not a safe procedure either, because complications such as abdominal pain, fever, atelectasis, or even death occurred ***(Sakai T. et al., 2002).***

Radiofrequency ablation (RFA) is a relatively new technique with the advantages of minimal invasion, rapid recovery, shorter hospitalization, and significant clinical outcome ***(Hayashi AH. et al., 2003)*** . It has been widely used to treat tumors of solid organs.***(Gazelle GS. et al., 2000)*** .

Recent advancement of RF equipment has extended its utility to such splenic conditions ***(Marangio A. et al., 2002)*** as metastases of colonic and renal malignancies (***Wood BJ. et al., 2001)*** hypersplenism, splenic injury, and partial splenectomy ***(Velanovich V., 2003)***.

Aim of work

To highlight the role of radiofrequency ablation as well as to assess its feasibility and safety in management of secondary splenomegaly, hypersplenism and portal hypertension.

I-ANATOMY OF THE SPLEEN

I-Anatomy Of The Spleen

The spleen is the largest single mass of lymphoid tissue in the body. It is reddish in color, ovoid in shape with a notched anterior border ***(Liu et al., 1996).***

The normal spleen lies in the left upper quadrant. Its longest axis lies in the line of the tenth rib with the convex diaphragmatic surface situated between the ninth and eleven ribs. The spleen is concave infero-medially ***(Anderws, 2000)***.

Its posterior border lies about 4cm from the mid dorsal line at the level of the tenth thoracic vertebral spine; its anterior border reaches the mid axillary line ***(Grobler, 1980)***.

Normal splenic dimensions are variable, but on average it measures 12cm in length. Weight varies from 50-300g, with an average of 150g. The normal adult spleen decreases in size with age ***(Andrews, 2000)*.**

Embryology of the spleen:

As Embryologically, it is formed by numerous splenunculi which fuse. Occasionally (10%) unfused and accessory splenunculi are demonstrated by C.T. and U.S. and tend to lie in the region of the hilum or the lienorenal ligament **(fig.1).** ***(Mitchell and Dick 2006).***

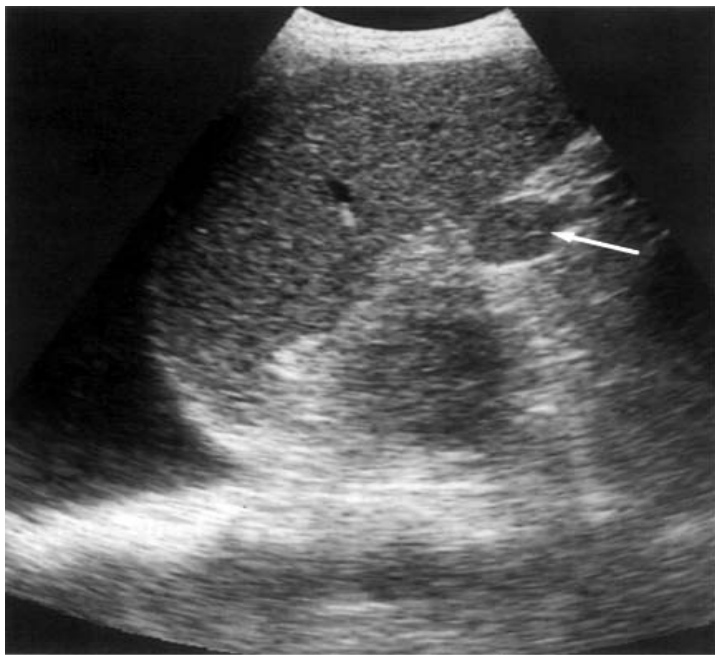

Fig.(1) A splenule (arrow) at the hilum of the spleen. ***(AbdominalUS)***

(Mitchell and Dick, 2006)

Relations of the spleen

The spleen has two surfaces, the diaphragmatic surface which is notched on its inferior border and the hilar surface that lies between the stomach and the left kidney. The spleen is related medially to the stomach and the tail of the pancreas. Anteriorly. It lies in close proximity to the left colonic flexure (the splenic flexure) and posteriorly it is related to the left kidney and suprarenal gland ***(fig 2) (Drake et al., 2007).***

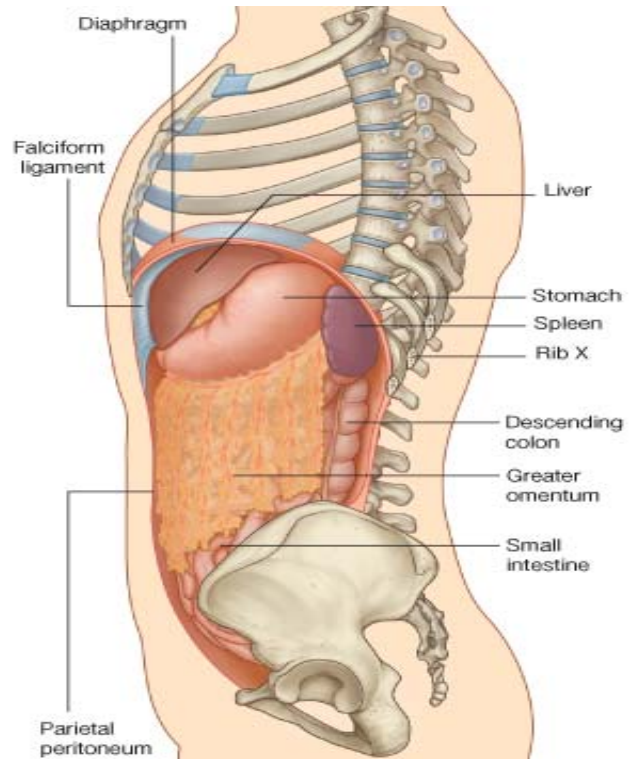

Fig. (2) Illustrating relations the spleen (Drake et al., 2007).

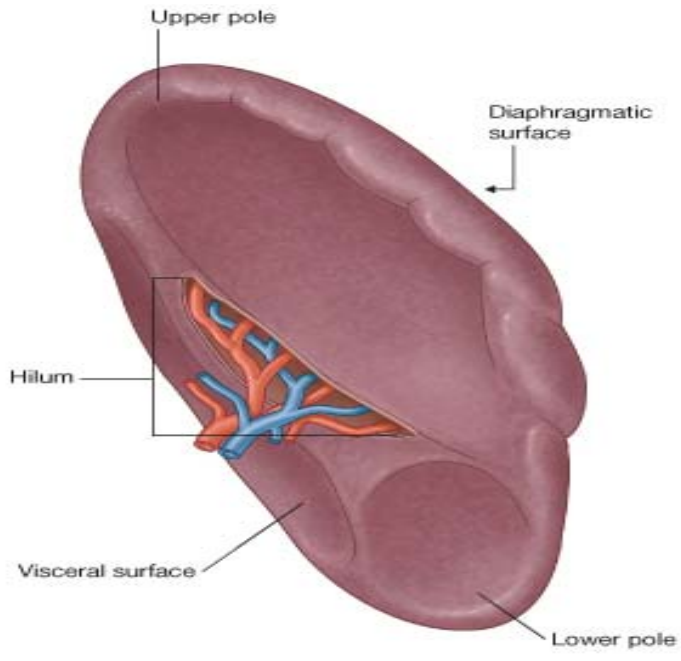

Fig. (3) Illustrating surfaces of the spleen (Drake, et al., 2007).