MRI of Transplanted Liver

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Liver Transplantation

This is now an established treatment option for many forms of chronic liver disease that lead to cirrhosis and failure of synthetic liver function. In addition selected patients with liver tumours that are within strict criteria (generally small tumours, few in number and with no extra-hepatic spread) may be eligible for transplantation. Most recipients can expect an 80% or better five year survival. Liver grafts are donated usually by patients who have suffered acute traumatic or cerebrovascular injury and who are brain dead. In some areas of the world cadaveric donors are not considered acceptable for religious and cultural reasons and live donors are used, although this is not without risk to the donors.

The transplant procedure involves replacing the diseased liver and creating anastomoses between the donor and recipient for the IVC, hepatic artery, portal vein and bile duct. These anastomoses are one of the most important factors in subsequent graft survival.

Post Transplant Complications

Grafts may fail to function from the start – primary non function, usually as a result of preservation injury or a high liver fat content. In this setting imaging excludes any vascular or biliary cause and facilitates the diagnosis. Immediate post-operative complications also include anastomotic breakdown, haematoma formation, infection and wound dehiscence. Acute graft failure may result from thrombosis of the hepatic artery or less commonly the portal vein. Sub-acute graft failure, including biliary leaks and biliary strictures may also result from hepatic artery thrombosis or stenosis. Acute and chronic graft rejection may also occur but this is now relatively infrequent owing to the use of improved immunosuppressive drug therapy in recent years. A more frequent problem is the recurrence in the graft of the original disease such as hepatitis C virus or primary sclerosing cholangitis.

Role of MRI

Virtually all imaging techniques are used in an integrated way in support of liver transplantation. Doppler ultrasound and contrast enhanced CT are predominantly used in the early post-operative period to assess the acute complications of liver transplantation, including vascular occlusion. Catheter angiography is also used to confirm, and occasionally treat, vascular complications when appropriate. MRI is capable of demonstrating most vascular complications and parenchymal lesions, but is most frequently used in the sub-acute and chronic settings. MRI has particular value in the demonstration of biliary complications, including leaks, strictures, and biliary cast formation through the use of MRCP. MRI can also be useful for the diagnosis of chronic vascular complications such as recurrent Budd-Chiari syndrome (occlusion of the hepatic veins). MRI and CT are also used to follow patients transplanted for malignant tumours who are at high risk of recurrent disease. In the future new techniques such as MR elastography are likely to have an important role in the detection and monitoring of recurrent chronic liver disease thereby reducing the need for serial liver biopsy.