(*del Radiology)
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January Review

MR Imaging Evaluation of the Postoperative Knee1

The increased number of patients undergoing arthroscopy or surgery of the knee for sports medicine injuries is leading to increased numbers of patients who require imaging after surgery because of failure to improve, recurrent symptoms, or new injury. As in preoperative patients, magnetic resonance (MR) imaging is the most valuable imaging method for postoperative evaluation of the knee. Surgical changes increase the difficulty of diagnosis of abnormalities in the knee with MR imaging. MR arthrography with direct intraarticular injection of contrast material can help improve evaluation of the postoperative meniscus and possibly help improve evaluation of anterior cruciate ligament grafts in patients after surgery. Recognition of the normal postoperative MR imaging appearance of the structures in the knee and of abnormalities is essential to accurate MR imaging evaluation of these patients.

(*del Radiology)
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Februrary Review

Digital Mammography[1]

In digital mammography, the processes of image acquisition, display, and storage are separated, which allows optimization of each. Radiation transmitted through the breast is absorbed by an electronic detector, the response of which is faithful over a wide range of intensities. Once this information is recorded, it can be displayed by using computer image-processing techniques to allow arbitrary settings of image brightness and contrast, without the need for further exposure to the patient. In this article, the current state of the art in technology for digital mammography and data from clinical trials that support the use of the technology will be reviewed. In addition, several potentially useful applications that are being developed with digital mammography will be described.

(*del Radiology)
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March
Review

Perfusion Imaging of the Liver: Current Challenges and Future Goals1

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Improved therapeutic options for hepatocellular carcinoma and metastatic disease place greater demands on diagnostic and surveillance tests for liver disease. Existing diagnostic imaging techniques provide limited evaluation of tissue characteristics beyond morphology; perfusion imaging of the liver has potential to improve this shortcoming. The ability to resolve hepatic arterial and portal venous components of blood flow on a global and regional basis constitutes the primary goal of liver perfusion imaging. Earlier detection of primary and metastatic hepatic malignancies and cirrhosis may be possible on the basis of relative increases in hepatic arterial blood flow associated with these diseases. To date, liver flow scintigraphy and flow quantification at Doppler ultrasonography have focused on characterization of global abnormalities. Computed tomography (CT) and magnetic resonance (MR) imaging can provide regional and global parameters, a critical goal for tumor surveillance. Several challenges remain: reduced radiation doses associated with CT perfusion imaging, improved spatial and temporal resolution at MR imaging, accurate quantification of tissue contrast material at MR imaging, and validation of parameters obtained from fitting enhancement curves to biokinetic models, applicable to all perfusion methods. Continued progress in this new field of liver imaging may have profound implications for large patient groups at risk for liver disease.

(*del Radiology)
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March
Review

Roux-en-Y Gastric Bypass for Clinically Severe Obesity: Normal Appearance and Spectrum of Complications at Imaging[1]

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Surgery currently appears to be the most effective method to curtail the effects of morbid obesity and all of its comorbid conditions. Although the ideal procedure has yet to be devised, Roux-en-Y gastric bypass has proved to be successful for many morbidly obese patients pursuing weight loss and increased health. As the technical aspects of this procedure become less cumbersome and the patient population increases, it is vital for radiologists to be proficient in the specific evaluation of these patients, in order to provide optimal care. Complications can be minimized, managed more efficiently, or prevented with prompt evaluation by the radiologist. It is important to appreciate the patency of both the gastrojejunostomy and the jejunojejunostomy, as well as adequate progression of contrast material before the patient is discharged (preferably 24–72 hours after surgery). Follow-up complications include anastomotic leak, staple-line disruption, stomal stenosis, occlusion of the Roux limb, small-bowel obstruction due to adhesions or internal hernia, and obstruction of the enteroenterostomy leading to acute gastric distention. These complications may be life threatening, since clinical symptoms are often inconclusive. To achieve optimal outcome, therefore, conventional radiographic and computed tomographic studies should not be delayed.