

BİLGİSAYARLI TOMOGRAFİDE GÖRÜNTÜ YORUMLAMANIN TEMELLERİ

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Giriş

Radyografik görüntüleme, x-ışını tüplerinden yönlendirilen radyasyonun dokuda soğurulması ve doku yoğunluk farklılıklarının film üzerine iki boyutlu olarak yansıtılması temel prensibine dayanır. Bilgisayarlı tomografide (BT) tek plan yerine hasta etrafında döndürülen X-ışın tüpleriyle elde edilmiş çok sayıda ardışık görüntüler, bilgisayar yardımıyla sayısallaştırılır ve matematiksel işlemlerle kesitler haline dönüştürülür (1). Tıbbi görüntülemede çığır açmış olan BT tekniği, Godfrey Hounsfield ve Allan Cormack tarafından 1971 yılında geliştirilmiş, 1979 yılında Fizyoloji veya Tıp alanında Nobel ödülüne layık görülmüştür. İlk BT görüntüleri beyinden elde edilmiş ve 1972'de yayınlanmıştır (2).

Günümüzde BT, yaygın olarak bulunan, nispeten ucuz, hızlı, uygulaması kolay ve genellikle ilk başvuru kesitsel görüntüleme yöntemi olarak yerini almıştır.

BT Teknolojisi

BT cihazı; jeneratör, tarama ünitesi (röntgen tüpleri, foton dedektörleri, ekran), hasta masası, görüntü işlemcisi, kontrol birimi ünitelerinden oluşur. BT'de uzun yıllar tek dedektörlü cihazlarla görün-

tü elde edilmiş, günümüzde eş zamanlı görüntü alan ve işleyebilen çok kesitli BT (ÇKBT) beşinci nesil (hem X-ışını tüpünün hem de çok sayıda dedektörün hastanın etrafında döndüğü) geometriyi kullanan sistemler geliştirilmiştir (3).

Güncel BT cihazları, 0,3 saniyeden daha kısa rotasyon süresiyle bir dönüşte 16 cm'yi (256 dilim) kapsayabilmektedir. Nefes veya peristaltizmden kaynaklanan hareket artefaktları en aza indirilmiştir. Yeni dedektörler 0,25 mm'nin altında uzaysal çözünürlük sağlamaktadır. Hızla elde edilebilen, ince detaylar sağlayabilen üç boyutlu, çok düzlemli, volümetrik görüntüleme teknikleri, lezyon saptama ve görselleştirmede yeni olanaklar sunmuştur (1).

Çok düzlemli yeniden şekillendirilmiş görüntüler (Multiplanar Reconstruction, MPR), maksimum yoğunluk projeksiyonları (Maximum Intensity Projection, MIP), yüzey tanımlamalı görüntüler (Shaded Surface Display, SSD) veya hacim oluşturma teknikleri (Volume Rendering Technique, VRT) gibi teknikler bu olanaklardan bazılarıdır (4). Pulmoner ve koroner vasküler anjiyografi, çift enerjili sistemler, hibrit cihazlar gibi çok farklı yeni klinik uygulama mümkün hale gelmiş, böylelikle BT'nin kullanım alanı hızla artmıştır (4).

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virüsü (HIV), tbc, enfeksiyöz mononükleoz, sistemik lupus eritematozus, toksisite, amiloidozis, Kawasaki, aşırı duyarlılık sendromları, Castleman, IgG4 ile ilişkili hastalık bunlardan bazılarıdır (316).

BT'de Nodal Değerlendirmede Tuzaklar

Hem normal yapılar hem de diğer patolojik süreçler nodal hastalığı taklit edebilir. Retroperitoneuma yakın ince bağırsak ansları; kontrastsız tetkiklerde dilate veya tortüöz vasküler yapılar, overler, sisterna şili genişlemesi, paraaortik alana yakın peritoneal tümör implantları, postoperatif hematom, apse ve lenfösel lenf nodlarına benzer yanıltıcı görüntü verebilirler. Kaudat lobun papiller uzantısı, diyafragmatik krus ve nadiren aksesuar dalak lenf nodunu taklit edebilir. İntravenöz ve negatif veya pozitif oral kontrastlı tetkik ve multiplanar değerlendirmeyle tuzaklardan büyük oranda kaçınmak mümkündür (316,317,320).

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