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Adrenal Bez Kitlelerini Değerlendirmede Nükleer Tıp Yöntemleri

Evrım SÜRER BUDAK¹

Nükleer tıpta fonksiyonel görüntülemenin temelini; görüntülenecek organa selektif, organ fizyolojisine uygun biyoaktif bir maddenin (KİT/farmasötik) radyasyon yayan bir radyoizotop (radyonüklid) ile işaretlenerek vücuda verilmesi ve organda radyasyonun yol açtığı ışımanın deteksiyonu oluşturur. Tanı/görüntüleme ve tedavi amacı ile kullanılan bu maddelere radyofarmasötik denmektedir. Radyofarmasötiklerin çoğu işaretli bileşiklerdir. İyot gibi bazı radyoizotoplar ise, biyoaktif bir işareleyici olmaksızın hedef organda doğrudan tutulum gösterebilirler. Biyoaktif madde hedef organda selektif olarak lokalize olmalı, toksik olmamalı, vücuttan olabildiğince çabuk atılmalı ve radyoizotoplar ile işaretlenirken molekül yapısı değişmemelidir.

Nükleer tıp, fonksiyonel bir görüntüleme sağladığından adrenal bez fizyolojisine kısaca değinmek faydalı olacaktır. Adrenal bezler, korteks ve medulla olmak üzere iki bölümden oluşur. Dış kısımda bulunan korteks mezodermden, santralde yer alan medulla ise nöral krestten köken alır. Adrenal korteks; mineralokortikoid (başlıca aldosteron) üretiminden sorumlu zona glomeruloza, glukokortikoid (başlıca kortizol) üretiminden sorumlu zona fasikulata ve seks steroidleri üretiminden sorumlu zona retikularis olmak üzere 3 zondan oluşur. Adrenal medulladan ise katekolaminler (adrenalin ve noradrenalin) salgılanmaktadır. Adrenal korteks ve medullanın, morfolojik görüntüleme yöntemleri ile ayrımı mümkün değildir.

Ultrason (USG), bilgisayarlı tomografi (BT) ve manyetik rezonans görüntüleme (MRG) gibi görüntüleme yöntemlerinin kullanımının artması ile orantılı ola-

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tada FDG ile daha fazla lezyon saptanmıştır. FDG, beyin ve karaciğerde yüksek oranda tutulum gösterdiğinden, özellikle bu alana olan metastazların daha iyi lezyon/geri plan oranına sahip ⁶⁸Ga-pentixafor ile değerlendirilmesi önerilmiştir (88).

Primer hiperaldosteronizm: Ex-vivo çalışmalarda, aldosterenomalarda yüksek CXCR4 ekspresyonu ve bunun da CYPB2 ekspresyonu ile olan güçlü korelasyonu bildirilmiştir. Aldosterenoması olan 9 hastayı içeren bir çalışmada, adenom olan tarafta yüksek tutulum gösterilmiştir (89). Prospektif bir diğer çalışmada, kanser tanısı olmayıp adrenal kitle saptanan hastalarda, SUVmax eşik değerinin 11.18 olarak alınması durumunda ⁶⁸Ga-pentixafor PET/BT'nin duyarlılığı %88, özgüllüğü %100 olarak bildirilmiştir ve adrenokortikal kitleleri değerlendirmede, fonksiyonel lateralizasyon ve karakterizasyon sağlamada yüksek potansiyeli olan noninvaziv bir teknik olduğu vurgulanmıştır (90).

Prostat Spesifik Membran Antijen (PSMA) PET/BT

Prostat kanseri evreleme ve yeniden evrelemesinde sıklıkla kullanılmaktadır. AKK hastalarına ait operasyon materyallerinin ex-vivo analizinde, agresif tümörlerde artmış neovaskularizasyonun tümör hücre yüzeyindeki PSMA overekspresyonu ile ilişkili olduğu gösterilmiştir (91). Literatürde şu an için tek bir olgu sunumu bulunsa da, AKK'da PSMA PET/BT'nin rolü ileri çalışmalar ile değerlendirilebilir.

Sonuç olarak; konvansiyonel BT ve MRG gibi görüntüleme yöntemlerinin tanıda yetersiz kaldığı insidental adrenal lezyonlarda, nükleer fonksiyonel-moleküler görüntüleme ile oldukça faydalı sonuçlar elde edilebilmektedir. PET ajanlarından ¹⁸F-FDG ile benign-malign ayrımı, ¹¹C-MITO ile adrenokortikal/non-adrenokortikal ayrımı, ¹⁸F-DPA/DOPA ve ⁶⁸Ga-DOTA peptid ile nöroendokrin orijin ayrımı büyük oranda yapılabilmekte, hastalar gerek cerrahi, gerek medikal/radyonüklid tedavi seçimi açısından yönlendirilebilmektedir.

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