

5. BÖLÜM

MEME KANSERİNDE AKSİLLANIN GÖRÜNTÜLENMESİ VE GİRİŞİMSEL İŞLEMLER

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Aksilla sınırları süperiorda klavikula, skapula ve birinci kosta; posterior-da subskapularis, teres major ve latissimus dorsi kasları; anterior-da pektoralis major ve minor kasları; medialde serratus anterior ve ilk dört kosta; lateralde korakobrakialis ve biceps kasi kısa başı tarafından çizilen piramid şeklinde bir alandır. Aksiller boşlukta cilt, cilt altı yağlı doku, subkutanöz glandlar, meme dokusu, lenf nodları, brakial pleksus, aksiller arter ve ven bulunur (1).

Aksillada benign ve malign birçok patoloji görülebilir. Ancak aksiller lenf nodları (LN) varlığı meme kanserinin en önemli prognostik faktörlerinden biri olduğundan lenf nodlarının değerlendirilmesi ayrı bir öneme sahiptir (2). Palpabl aksiller LN olan veya görüntüleme yöntemleri ile metastatik olduğu gösterilmiş LN'ları olan olgular 'klinik olarak nod pozitif', bu yöntemlerle metastatik lenf nodu saptanmamış olanlar 'klinik olarak nod negatif' meme kanseri şeklinde tariflenir (3). LN'undaki 0.2 mm'den küçük metastatik depozitler 'izole tümör hücreleri', 0.2-2 mm arasındakiler mikrometastaz olarak tanımlanır (4). Bu aşamadaki metastatik hastalık görüntüleme yöntemleri ile saptanamaz. LN metastazının kesin tanısı iğne biyopsileri, sentinel nod biyopsisi (SLNB) veya aksiller lenf nodu disseksiyonu (ALND) ile belirlenir. ALND'nun morbiditesi yüksektir ve erken evre meme kanserinin tedavisinde sağ kalıma katkısı da yoktur (3). Bu sebeplerden dolayı son dönemlerde klinik pratikte kabul gören uygulama klinik olarak nod pozitif hastalarda ALND, nod negatif erken evre hastalarda SLNB'dir. Hastaya birden fazla departmanda işlem yapılması, operasyon süresinin uzaması, yanlış negatif sonuçlar SLNB'nin dezavantajlarıdır. Bu

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SONUÇ

Erken evre meme kanserinde SLNB'nin giderek daha çok uygulanması hatta bazen aksiller cerrahi tercih edilmemesi preoperatif dönemde görüntüleme yöntemleri ile metastatik LN'larının saptanmasına olan ihtiyacı arttırmaktadır. US noninvaziv, uygun maliyetli ve kolay ulaşılır olup erken evre meme kanserinde gereksiz aksiller cerrahi önleyen bir yöntemdir. Günümüzde cerrahi evreleme hala görüntüleme yöntemleri ile yapılan evrelemeden üstün olsa da görüntüleme yöntemleri çok önemli bir yere sahiptir. Son dönemde görüntülemede alanındaki yeni yaklaşımlarla metastatik LN'larının daha doğru saptanması amaçlanmaktadır. US eşliğinde SLNB ile beraberinde primer kitlenin perkütanöz eksizyonu ve ablasyonu ilerde tercih edilen bir yöntem olabilir (53). Kontrastlı US eşliğinde SLN tayini ve biyopsisi yapılabilir (54). Radiomics, radyolojik görüntülerin sayısal verileri üzerinde yapay zeka yöntemlerini kullanarak çalışan ve hızla büyümekte olan bir araştırma alanıdır. Radiomics veya yapay zeka entegre görüntüleme ve klinik bilgi metastatik LN'larının daha erken ve daha doğru tespitinde umut vericidir (55,56).

KAYNAKÇA

1. Leibman AJ, Wong R. Findings on mammography in the axilla. *AJR Am J Roentgenol.* 1997;169(5):1385-1390. doi:10.2214/ajr.169.5.9353463
2. Beenken SW, Urist MM, Zhang Y, et al. Axillary lymph node status, but not tumor size, predicts locoregional recurrence and overall survival after mastectomy for breast cancer. *Ann Surg.* 2003;237(5):732-739. doi:10.1097/01.SLA.0000065289.06765.71
3. Ecanow JS, Abe H, Newstead GM, Ecanow DB, Jeske JM. Axillary staging of breast cancer: what the radiologist should know. *Radiographics.* 2013;33(6):1589-1612. doi:10.1148/rg.336125060
4. Ching CD, Edge SB, Krishnamurthy S, Singletary SE. Initial AJCC staging. In: Kuerer HM, ed. *Kuerer's breast surgical oncology.* New York, NY: McGraw-Hill, 2010; 141-144.
5. Dialani V, James DF, Slanetz PJ. A practical approach to imaging the axilla. *Insights Imaging.* 2015;6(2):217-229. doi:10.1007/s13244-014-0367-8
6. Temel Radyoloji, Editör İbrahim Tanzer Sancak (Gül Esen). ISBN:978-975-277-561-9)..
7. Chang JM, Leung JWT, Moy L, Ha SM, Moon WK. Axillary Nodal Evaluation in Breast Cancer: State of the Art. *Radiology.* 2020;295(3):500-515. doi:10.1148/radiol.2020192534
8. Ojeda-Fournier H, Yang WT, Berg WA. Axillary adenopathy. In: Berg WA, Leung JWT, eds. *Diagnostic Imaging: Breast.* 3rd ed. Philadelphia, Pa: Elsevier, 2019; 821
9. Lim ET, O'Doherty A, Hill AD, Quinn CM. Pathological axillary lymph nodes detected at mammographic screening. *Clin Radiol.* 2004;59(1):86-91. doi:10.1016/s0009-9260(03)00339-8
10. Nastasia Serban Mammography techniques and Review, Ultrasound Axillary Imaging Chapter 2, [http:// dx. doi.org/10.5772/59730](http://dx.doi.org/10.5772/59730)
11. Alvarez S, Añorbe E, Alcorta P, López F, Alonso I, Cortés J. Role of sonography in the diagnosis of axillary lymph node metastases in breast cancer: a systematic review. *AJR Am J Roentgenol.* 2006;186(5):1342-1348. doi:10.2214/AJR.05.0936
12. Houssami N, Diepstraten SC, Cody HS 3rd, Turner RM, Sever AR. Clinical utility of ultrasound-needle biopsy for preoperative staging of the axilla in invasive breast cancer. *Anticancer Res.* 2014;34(3):1087-1097.

13. Song SE, Seo BK, Lee SH, et al. Classification of Metastatic versus Non-Metastatic Axillary Nodes in Breast Cancer Patients: Value of Cortex-Hilum Area Ratio with Ultrasound. *J Breast Cancer*. 2012;15(1):65-70. doi:10.4048/jbc.2012.15.1.65.
14. Yang WT, Metreweli C, Lam PK, Chang J. Benign and malignant breast masses and axillary nodes: evaluation with echo-enhanced color power Doppler US. *Radiology*. 2001;220(3):795-802. doi:10.1148/radiol.2203001545
15. Taylor K, O'Keeffe S, Britton PD, et al. Ultrasound elastography as an adjuvant to conventional ultrasound in the preoperative assessment of axillary lymph nodes in suspected breast cancer: a pilot study. *Clin Radiol*. 2011;66(11):1064-1071. doi:10.1016/j.crad.2011.05.015
16. Piscaglia F, Nolsøe C, Dietrich CF, et al. The EFSUMB Guidelines and Recommendations on the Clinical Practice of Contrast Enhanced Ultrasound (CEUS): update 2011 on non-hepatic applications. *Ultraschall Med*. 2012;33(1):33-59. doi:10.1055/s-0031-1281676
17. Argus A, Mahoney MC. Indications for breast MRI: case-based review. *AJR Am J Roentgenol*. 2011;196(3 Suppl):WS1-WS14. doi:10.2214/AJR.09.7213
18. Mann RM, Cho N, Moy L. Breast MRI: State of the Art. *Radiology*. 2019;292(3):520-536. doi:10.1148/radiol.2019182947
19. Baltzer PA, Dietzel M, Burmeister HP, et al. Application of MR mammography beyond local staging: is there a potential to accurately assess axillary lymph nodes? evaluation of an extended protocol in an initial prospective study. *AJR Am J Roentgenol*. 2011;196(5):W641-W647. doi:10.2214/AJR.10.4889
20. Heywang SH, Hahn D, Schmidt H, et al. MR imaging of the breast using gadolinium-DTPA. *J Comput Assist Tomogr*. 1986;10(2):199-204. doi:10.1097/00004728-198603000-00005.
21. Leithner D, Moy L, Morris EA, Marino MA, Helbich TH, Pinker K. Abbreviated MRI of the Breast: Does It Provide Value?. *J Magn Reson Imaging*. 2019;49(7):e85-e100. doi:10.1002/jmri.26291
22. Partridge SC, Stone KM, Strigel RM, DeMartini WB, Peacock S, Lehman CD. Breast DCE-MRI: influence of postcontrast timing on automated lesion kinetics assessments and discrimination of benign and malignant lesions. *Acad Radiol*. 2014;21(9):1195-1203. doi:10.1016/j.acra.2014.04.013
23. Koh DM, Collins DJ. Diffusion-weighted MRI in the body: applications and challenges in oncology. *AJR Am J Roentgenol*. 2007;188(6):1622-1635. doi:10.2214/AJR.06.1403
24. Basara I, Orguc S, Coskun T, The role of Diffusion Weighted Imaging In The Assessment Of Axillary Lymph Nodes, *J Breast Health* 2013; 9: 76-81 DOI: 10.5152/tjbh.2013.08
25. Memarsadeghi M, Riedl CC, Kaneider A, et al. Axillary lymph node metastases in patients with breast carcinomas: assessment with nonenhanced versus uspio-enhanced MR imaging. *Radiology*. 2006;241(2):367-377. doi:10.1148/radiol.2412050693
26. Groheux D, Espié M, Giacchetti S, Hindié E. Performance of FDG PET/CT in the clinical management of breast cancer. *Radiology*. 2013;266(2):388-405. doi:10.1148/radiol.12110853
27. Ulaner GA. PET/CT for Patients With Breast Cancer: Where Is the Clinical Impact?. *AJR Am J Roentgenol*. 2019;213(2):254-265. doi:10.2214/AJR.19.21177
28. Rautiainen S, Masarwah A, Sudah M, et al. Axillary lymph node biopsy in newly diagnosed invasive breast cancer: comparative accuracy of fine-needle aspiration biopsy versus core-needle biopsy. *Radiology*. 2013;269(1):54-60. doi:10.1148/radiol.13122637
29. Koelliker SL, Chung MA, Mainiero MB, Steinhoff MM, Cady B. Axillary lymph nodes: US-guided fine-needle aspiration for initial staging of breast cancer--correlation with primary tumor size. *Radiology*. 2008;246(1):81-89. doi:10.1148/radiol.2463061463
30. Kim MJ, Park BW, Lim JB, et al. Axillary lymph node metastasis: CA-15-3 and carcinoembryonic antigen concentrations in fine-needle aspirates for preoperative diagnosis in patients with breast cancer. *Radiology*. 2010;254(3):691-697. doi:10.1148/radiol.09091031
31. Abe H, Schmidt RA, Kulkarni K, Sennett CA, Mueller JS, Newstead GM. Axillary lymph nodes suspicious for breast cancer metastasis: sampling with US-guided 14-gauge core-ne-

- edle biopsy--clinical experience in 100 patients. *Radiology*. 2009;250(1):41-49. doi:10.1148/radiol.2493071483.
32. Damera A, Evans AJ, Cornford EJ, et al. Diagnosis of axillary nodal metastases by ultrasound-guided core biopsy in primary operable breast cancer. *Br J Cancer*. 2003;89(7):1310-1313. doi:10.1038/sj.bjc.6601290
 33. Lyman GH, Somerfield MR, Bosserman LD, Perkins CL, Weaver DL, Giuliano AE. Sentinel Lymph Node Biopsy for Patients With Early-Stage Breast Cancer: American Society of Clinical Oncology Clinical Practice Guideline Update. *J Clin Oncol*. 2017;35(5):561-564. doi:10.1200/JCO.2016.71.0947
 34. Caudle AS, Yang WT, Krishnamurthy S, et al. Improved Axillary Evaluation Following Neoadjuvant Therapy for Patients With Node-Positive Breast Cancer Using Selective Evaluation of Clipped Nodes: Implementation of Targeted Axillary Dissection. *J Clin Oncol*. 2016;34(10):1072-1078. doi:10.1200/JCO.2015.64.0094
 35. Woods RW, Camp MS, Durr NJ, Harvey SC. A Review of Options for Localization of Axillary Lymph Nodes in the Treatment of Invasive Breast Cancer. *Acad Radiol*. 2019;26(6):805-819. doi:10.1016/j.acra.2018.07.002
 36. Siso C, de Torres J, Esgueva-Colmenarejo A, et al. Intraoperative Ultrasound-Guided Excision of Axillary Clip in Patients with Node-Positive Breast Cancer Treated with Neoadjuvant Therapy (ILINA Trial) : A New Tool to Guide the Excision of the Clipped Node After Neoadjuvant Treatment. *Ann Surg Oncol*. 2018;25(3):784-791. doi:10.1245/s10434-017-6270-z
 37. Shin K, Caudle AS, Kuerer HM, et al. Radiologic Mapping for Targeted Axillary Dissection: Needle Biopsy to Excision. *AJR Am J Roentgenol*. 2016;207(6):1372-1379. doi:10.2214/AJR.16.16545
 38. Plecha D, Bai S, Patterson H, Thompson C, Shenk R. Improving the Accuracy of Axillary Lymph Node Surgery in Breast Cancer with Ultrasound-Guided Wire Localization of Biopsy Proven Metastatic Lymph Nodes. *Ann Surg Oncol*. 2015;22(13):4241-4246. doi:10.1245/s10434-015-4527-y
 39. Park S, Koo JS, Kim GM et al. Feasibility of Charcoal Tattooing of Cytology-Proven Metastatic Axillary Lymph Node at Diagnosis and Sentinel Lymph Node Biopsy after Neoadjuvant Chemotherapy in Breast Cancer Patients. *Cancer Res Treat*. 2018;50 (3): 801-812.2017. August.17.doi:https://doi.org/10.4143/crt.2017.210
 40. Goudreau SH, Joseph JP, Seiler SJ. Preoperative Radioactive Seed Localization for Nonpalpable Breast Lesions: Technique, Pitfalls, and Solutions. *Radiographics*. 2015;35(5):1319-1334. doi:10.1148/rg.2015140293.
 41. NRC:iodine-125 and palladium-103 low dose rate brachytherapy seeds used for localization of non-palpable lesions. Available at:https://www.nrc.gov/materials/miau/med-use/toolkit/seed-localization.html.(Accessed:25thMay2018
 42. Price ER, Khoury AL, Esserman LJ, Joe BN, Alvarado MD. Initial Clinical Experience With an Inducible Magnetic Seed System for Preoperative Breast Lesion Localization. *AJR Am J Roentgenol*. 2018;210(4):913-917. doi:10.2214/AJR.17.18345
 43. FDA clears world's first and only wire-free radar breast tumor localization system for long term implant capabilities _ Cianna Medical. Available at:https://www.ciannamedical.com/cianna_news_releases/fda-clears-worlds-first-wire-free-radar-breast-tumor-localization-system-long-term-implant-capabilities/. (Accessed: 30th May 2018
 44. Dauphine C, Reicher JJ, Reicher MA, et al. A prospective clinical study to evaluate the safety and performance of wireless localization of non-palpable breast lesions using radiofrequency identification technology. *Am J Roentgenol* 2015;204:W720-W723
 45. A J Leibman and R Wong. Findings on mammography in the axilla. *American Journal of Roentgenology* 1997 169:5, 1385-1390
 46. Koyama T, Ueda H, Togashi K, Umeoka S, Kataoka M, Nagai S. Radiologic manifestations of sarcoidosis in various organs. *Radiographics*. 2004;24(1):87-104. doi:10.1148/rg.241035076

47. Yoo JL, Suh SI, Lee YH, et al. Gray scale and power Doppler study of biopsy-proven Kikuchi disease. *J Ultrasound Med.* 2011;30(7):957-963. doi:10.7863/jum.2011.30.7.957
48. Esen G. Ultrasound of superficial lymph nodes. *Eur J Radiol.* 2006;58(3):345-359. doi:10.1016/j.ejrad.2005.12.039
49. Chang YW, Noh HJ, Hong SS, Hwang JH, Lee DW, Moon JH. Castleman's disease of the axilla mimicking metastasis. *Clin Imaging.* 2007;31(6):425-427. doi:10.1016/j.clinimag.2007.03.009
50. Park YM, Park JS, Yoon HK, Yang WT. Imaging-pathologic correlation of diseases in the axilla. *AJR Am J Roentgenol.* 2013;200(2):W130-W142. doi:10.2214/AJR.12.9259
51. Oliff MC, Birdwell RL, Raza S, Giess CS. The Breast Imager's Approach to Nonmammary Masses at Breast and Axillary US: Imaging Technique, Clues to Origin, and Management. *Radiographics.* 2016;36(1):7-18. doi:10.1148/rg.2016150029
52. Arman JA, Lorente-Ramos RM, Garcia Gomez JM et al.(ECR 2011) Imaging the axilla. A pictorial review of imaging findings with pathologic correlation [https://doi.org/ 10.1594/ecr2011/C-0782](https://doi.org/10.1594/ecr2011/C-0782)
53. Parker SH, Dennis MA, Kaske TI. Identification of the sentinel node in patients with breast cancer. *Radiol Clin North Am.* 2000;38(4):809-823. doi:10.1016/s0033-8389(05)70202-5.
54. Nielsen Moody A, Bull J, Culpan AM, et al. Preoperative sentinel lymph node identification, biopsy and localisation using contrast enhanced ultrasound (CEUS) in patients with breast cancer: a systematic review and meta-analysis. *Clin Radiol.* 2017;72(11):959-971. doi:10.1016/j.crad.2017.06.121
55. Bae MS. Using Deep Learning to Predict Axillary Lymph Node Metastasis from US Images of Breast Cancer. *Radiology.* 2020;294(1):29-30. doi:10.1148/radiol.2019192339
56. Zhou LQ, Wu XL, Huang SY, et al. Lymph Node Metastasis Prediction from Primary Breast Cancer US Images Using Deep Learning. *Radiology.* 2020;294(1):19-28. doi:10.1148/radiol.2019190372