

9. BÖLÜM

İNDOSİYANİN YEŞİLİ İLE YAPILAN SENTİNEL NOD BİYOPSİ TEKNİĞİ VE BAŞARI ORANLARI

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GİRİŞ

Sentinel kelimesi ‘bekçi’ anlamına gelmektedir. Meme kanserinde sentinel lenf nodu (SLN) ise tümör hücrelerinin lenfatikler aracılığı ile drene olduğu ilk lenf nodunu tanımlar. Bu tümör hücrelerinin drene olma olasılığının en yüksek olduğu ilk lenf nodlarının incelenme prensibine dayanan minimal invaziv bu işleme sentinel lenf nodu biyopsisi (SLNB) denilmektedir (1-2).

Meme kanserinin tedavisinde SLNB aksiller diseksiyona gerek olup olmadığını belirleyen bir metoddur. SLNB sayesinde aksiller lenf nodlarının gereksiz diseksiyonu sonucu gelişebilecek morbiditelerin önüne geçilerek yaşam standartları yükseltilebilmektedir (3). SLN’nun saptanmasında günümüzde radyokolloid ve mavi boya yaygın olarak kullanılan tekniklerdir. Ancak bu tekniklerin kendilerine has avantajları ve dezavantajları mevcuttur. SLN’nun bulunma oranı radyokolloid yöntemi ile mavi boyaya göre daha yüksektir. Fakat bu yöntemde nükleer tıp ünitesine ve gama proba gereksinim duyulmaktadır. Ayrıca radyoaktif madde salınımı için alınması gereken birtakım tedbirler vardır. Mavi boyada bu bahsedilen problemler bulunmamaktadır. Mavi boya uygun maliyetli ve daha yaygın kullanılmaktadır. Fakat bu yönteminde anaflaktik şok gibi sistemik yan etkileri görülebildiği gibi enjeksiyon yerinde alerjik reaksiyonu ciltte pigmentasyon ve yağ nekrozu gibi lokal yan etkileride görülebilmektedir. Radyokolloid ile karşılaştırıldığında sadece mavi boya ile yapılan SLNB’ sinde SLN bulma oranları daha düşüktür (4-9).

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AVANTAJLARI VE DEZAVANTAJLARI

ICG-floresan lenfatiklerin eş zamanlı olarak görüntülenmesine izin vermekte ve bu nedenle daha hızlı sonuç vermektedir. Bu teknikte herhangi bir lisans alınmasına gerek yoktur. ICG'nin mavi boya tekniğinde olduğu gibi toksik ve alerjik etkileri olmadığı gösterilmiştir (28). Lenfatik drenajının iyi olması günümüzde rutin altın standart olarak kullanımda olan radyokolloid yöntem ve mavi boyanın eş zamanlı kullanımına benzer hatta daha iyi sonuçlar verebilir.

Vücut kitle indeksi (VKİ) ICG yönteminde başarı oranını etkileyebilecek bir faktördür. Çünkü bu yöntemde gerekli olan kızıl ötesine yakın kamera gereksinimi ve ICG'nin ciltten 1- 2 cm derinlikten floresan vermesi ise en önemli dezavantajdır (34). Bu dezavantaj obez hastalarda özellikle de VKİ > 30 olanlarda problem oluşturmaktadır.

SONUÇ

SLNB , klinik olarak aksiller evreleme için standart bir yaklaşımdır. Günümüzde SLNB için mavi boya, radyokolloid teknikleri tek tek veya kombine olarak en sık kullanılan yöntemlerdir. İCG'nin lenfatik drenajının iyi olması ve eş zamanlı görülebilir olması günümüzde rutin kullanımda olan radyokolloidin ve mavi boyanın eş zamanlı kullanımına benzer hatta daha iyi sonuçlar vermesinden dolayı sentinel lenf nodu biyopsisinde alternatif veya tamamlayıcı bir yöntem olarak kullanılabileceğini göstermektedir.

KAYNAKÇA

1. M Noguchi, K Tsugawa, E Bando, F Kawahara, K Miwa, K Yokoyama, K Nakajima, N Tonami. Sentinel lymphadenectomy in breast cancer: identification of sentinel lymph node and detection of metastases. *Breast Cancer Res Treat.* 1999 Jan;53(2):97-104. doi:10.1023/a:1006118827167.
2. Fraile M, Rull M, Julián FJ, Fusté F, Barnadas A, Llatjós M, Castellà E, Gonzalez JR, Vallejos V, Alastrué A, Broggi MA. Sentinel node biopsy as a practical alternative to axillary lymph node dissection in breast cancer patients: an approach to its validity. *Ann Oncol.* 2000 Jun;11(6):701-5. doi: 10.1023/a:1008377910967.
3. Anne Fleissig, Lesley J Fallowfield, Carolyn I Langridge, Leigh Johnson, Robert G Newcombe, J Michael Dixon, Mark Kissin, Robert E Mansel. Post-operative arm morbidity and quality of life. Results of the ALMANAC randomised trial comparing sentinel node biopsy with standard axillary treatment in the management of patients with early breast cancer. *Breast Cancer Res Treat.* 2006 Feb;95(3):279-93. doi: 10.1007/s10549-005-9025-7. Epub 2005 Sep 15.
4. Ahmed M, Purushotham AD, Douek M (2014) Novel techniques for sentinel lymph node biopsy in breast cancer: a systematic review. *Lancet Oncol* 15:e351–e362
5. Ahmed M, Purushotham AD, Horgan K et al (2015) Meta-analysis of superficial versus deep injection of radioactive tracer and blue dye for lymphatic mapping and detection of sentinel lymph nodes in breast cancer. *Br J Surg* 102:169–181

6. Niebling MG, Pleijhuis RG, Bastiaannet E et al (2016) A systematic review and meta-analysis of sentinel lymph node identification in breast cancer and melanoma, a plea for tracer mapping. *Eur J Surg Oncol* 42:466–473
7. Alhussini MA, Awad AT, Ashour MH et al (2016) Breast cancer sentinel node detection: an alternative solution for centers lacking nuclear technology. *Breast Care* 11:265–268
8. Derossis AM, Fey JV, Cody HS et al (2003) Obesity influences outcome of sentinel lymph node biopsy in early-stage breast cancer. *J Am Coll Surg* 197:896–901
9. Morrow M, Rademaker AW, Bethke KP et al (1999) Learning sentinel node biopsy: results of a prospective randomized trial of two techniques. *Surgery* 126:714–720
10. Alander JT, Kaartinen I, Laakso A, Patila T, Spillmann T, Tuchin VV, et al. A review of indocyanine green fluorescent imaging in surgery. *Int J Biomed Imaging* 2012; 2012: 940585.
11. Goonawardena J , Yong C, Law M. Use of indocyanine green fluorescence compared to radioisotope for sentinel lymph node biopsy in early-stage breast cancer: systematic review and meta-analysis. *Am J Surg.* 2020 Sep;220(3):665-676. doi: 10.1016/j.amjsurg.2020.02.001. Epub 2020 Feb 7.
12. Rauch S, Haid A, Jasarevic Z, et al. Does BMI affect the detection of sentinel lymph nodes with indocyanine green in early breast cancer patients? *Eur Surg.* 2017;49(4):165e170. <https://doi.org/10.1007/s10353-017-0480-2>
13. Grischke EM, Rohm C, Hahn M, et al. ICG € fluorescence technique for the detection of sentinel lymph nodes in breast cancer: results of a prospective open-label clinical trial. *Geburtshilfe Frauenheilkd.* 2015;75(9):935e940. <https://doi.org/10.1055/s-0035-1557905>.
14. Ballardini B, Santoro L, Sangalli C, et al. The indocyanine green method is equivalent to the ^{99m}Tc-labeled radiotracer method for identifying the sentinel node in breast cancer: a concordance and validation study. *Eur J Surg Oncol.* 2013;39(12):1332e1336. <https://doi.org/10.1016/j.ejso.2013.10.004>
15. Hojo T, Nagao T, Kikuyama M, et al. Evaluation of sentinel node biopsy by combined fluorescent and dye method and lymph flow for breast cancer. *Breast.* 2010;19(3):210e213. <https://doi.org/10.1016/j.breast.2010.01.014>
16. Polom K, Murawa D, Nowaczyk P, et al. Breast cancer sentinel lymph node mapping using near infrared guided indocyanine green and indocyanine green–human serum albumin in comparison with gamma emitting radioactive colloid tracer. *Eur J Surg Oncol : the journal of the European Society of Surgical Oncology and the British Association of Surgical Oncology.* 2012;38(2):137e142. <https://doi.org/10.1016/j.ejso.2011.11.004>.
17. Samorani D, Fogacci T, Panzini I, et al. The use of indocyanine green to detect sentinel nodes in breast cancer: a prospective study. *Eur J Surg Oncol : the journal of the European Society of Surgical Oncology and the British Association of Surgical Oncology.* 2015;41(1):64e70. <https://doi.org/10.1016/j.ejso.2014.10.047>.
18. Sugie T, Kinoshita T, Masuda N, et al. Evaluation of the clinical utility of the ICG fluorescence method compared with the radioisotope method for sentinel lymph node biopsy in breast cancer. *Ann Surg Oncol.* 2016;23(1):44e50. <https://doi.org/10.1245/s10434-015-4809-4>.
19. Valente SA, Al-Hilli Z, Radford DM, et al. Near infrared fluorescent lymph node mapping with indocyanine green in breast cancer patients: a prospective trial. *J Am Coll Surg.* 2019;228(4):672e678. <https://doi.org/10.1016/j.jamcollsurg.2018.12.001>.
20. Wishart GC, Loh SW, Jones L, et al. A feasibility study (ICG-10) of indocyanine green (ICG) fluorescence mapping for sentinel lymph node detection in early breast cancer. *Eur J Surg Oncol : the journal of the European Society of Surgical Oncology and the British Association of Surgical Oncology.* 2012;38(8):651e656. <https://doi.org/10.1016/j.ejso.2012.05.007>.
21. Schaafsma BE, Verbeek FP, Rietbergen DD, et al. Clinical trial of combined radio- and fluorescence-guided sentinel lymph node biopsy in breast cancer. *Br J Surg.* 2013;100(8):1037e1044. <https://doi.org/10.1002/bjs.9159>.
22. van der Vorst JR, Schaafsma BE, Verbeek FP, et al. Randomized comparison of near-infrared fluorescence imaging using indocyanine green and ^{99m}(m) technetium with or without pa-

- tent blue for the sentinel lymph node procedure in breast cancer patients. *Ann Surg Oncol*. 2012;19(13):4104e4111. <https://doi.org/10.1245/s10434-012-2466-4>.
23. Verbeek FP, Troyan SL, Mieog JS, et al. Near-infrared fluorescence sentinel lymph node mapping in breast cancer: a multicenter experience. *Breast Canc Res Treat*. 2014;143(2):333e342. <https://doi.org/10.1007/s10549-013-2802-9>.
 24. Mieog JSD, Troyan SL, Hutteman M, et al. Toward optimization of imaging system and lymphatic tracer for near-infrared fluorescent sentinel lymph node mapping in breast cancer. *Ann Surg Oncol*. 2011;18(9):2483e2491. <https://doi.org/10.1245/s10434-011-1566-x>.
 25. Hutteman M, Mieog JSD, van der Vorst JR, et al. Randomized, double-blind comparison of indocyanine green with or without albumin premixing for near-infrared fluorescence imaging of sentinel lymph nodes in breast cancer patients. *Breast Canc Res Treat*. 2011;127(1):163e170. <https://doi.org/10.1007/s10549-011-1419-0>
 26. Jung SY, Kim SK, Kim SW, et al. Comparison of sentinel lymph node biopsy guided by the multimodal method of indocyanine green fluorescence, radioisotope, and blue dye versus the radioisotope method in breast cancer: a randomized controlled trial. *Ann Surg Oncol*. 2014;21(4):1254e1259. <https://doi.org/10.1245/s10434-013-3437-0>.
 27. Mazouni C, Koual M, De Leeuw F, et al. Prospective evaluation of the limitations of near-infrared imaging in detecting axillary sentinel lymph nodes in primary breast cancer. *Breast J*. 2018;24(6):1006e1009. <https://doi.org/10.1111/tbj.13123>
 28. Murawa D, Hirche C, Dresel S, et al. Sentinel lymph node biopsy in breast cancer guided by indocyanine green fluorescence. *Br J Surg*. 2009;96(11): 1289e1294. <https://doi.org/10.1002/bjs.6721>.
 29. Papathemelis T, Jablonski E, Scharl A, et al. Sentinel lymph node biopsy in breast cancer patients by means of indocyanine green using the Karl Storz VITOM® fluorescence camera. *BioMed Res Int*. 2018;2018. <https://doi.org/10.1155/2018/6251468>. Article ID 6251468:8.
 30. Sorrentino L, Sartani A, Pietropaolo G, et al. A novel indocyanine green fluorescence-guided video-assisted technique for sentinel node biopsy in breast cancer. *World J Surg*. 2018;42(9):2815e2824. <https://doi.org/10.1007/s00268-018-4534-9>
 31. Wang Z, Cui Y, Zheng M, Ge H, Huang Y, Peng J, Xie H, Wang S. Comparison of indocyanine green fluorescence and methylene blue dye in the detection of sentinel lymph nodes in breast cancer. *Gland Surg* 2020;9(5):1495-1501 | <http://dx.doi.org/10.21037/gs-20-671>
 32. Joseph Lin, Li-Sheng Lin, Dar-Ren Chen, Kuo-Juei Lin, Yu-Fen Wang, Yu-Jun Chang. Indocyanine green fluorescence method for sentinel lymph node biopsy in breast cancer. *Asian J Surg*. 2020 Dec;43(12):1149-1153. doi: 10.1016/j.asjsur.2020.02.003.
 33. S.P. Somashekhar, C. Rohit Kumar, K.R. Ashwin, Shabber S. Zaveri, Anil Jampani, Y. Ramya, Rameshwaran Parameswaran, Sushmita Rakshit. Can Low-cost Indo Cyanine Green Fluorescence Technique for Sentinel Lymph Node Biopsy Replace Dual Dye (Radio-colloid and Blue Dye) Technique in Early Breast Cancer: A Prospective Two-arm Comparative Study. *Clin Breast Cancer*. 2020 Oct;20(5):e576-e583. doi: 10.1016/j.clbc.2020.03.013.
 34. Pleijhuis RG, Langhout GC, Helfrich W, Themelis G, Sarantopoulos A, Crane LM, et al. Near-infrared fluorescence (NIRF) imaging in breast-conserving surgery: assessing intraoperative techniques in tissue-simulating breast phantoms. *Eur J Surg Oncol* 2011; 37: 32-39.