

# ÜST EKSTREMİTE PERİFERİK SİNİR BLOKLARI

## 26. BÖLÜM

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### 1.Giriş

Periferik sinir blokları, uygun sinire uygun dozda ve şekilde lokal anestezi madde verilerek, yapılacak olan cerrahi işlem veya sonrasında post operatif analjezi sağlamak için kullanılır. Genel anestezinin ya da santral blokların uygun olmadığı ya da yüksek riskli olduğu durumlarda ultrasonunda kullanıma girilmesiyle çok tercih edilen yöntemlerdir. Üst ekstremitte periferik sinir blokları ultrason kullanımıyla ve yeterli uygulayıcı tecrübesiyle çok başarılı sonuçlar ortaya çıkarmıştır.

### 2.Üst ekstremitte periferik sinir blokları

#### 2.1.İnterskalen blok

İnterskalen blok tarihte ilk kez Etienne tarafından uygulanmış, sonrasında Winnie tarafından günümüzde uygulanan şekli tanımlanmıştır (1,2). O zamandan beri anestezi ve omuz analjezisi için önemli bir seçim haline geldi. Pippa ise posterior yaklaşımı bize tanımlamıştır (3).

Brakiyal plexus, C5-T1 tarafından oluşturulur. Servikal omurgadan çıkar ve ön ve orta skalen kasları arasında seyahat eder ve daha sonra aksiller arter çevresinin distalinden dolaşır. Üçgen şekilli interskalen boşluk, ilk kaburgaya yapıştığı yerlerde birbirlerinden uzaklaşan ön ve orta scalene kasları ile sınırlıdır (4). İnterskalen aralık önde m. scalenius anterior kasının arka kenarı, arkada m. scalenius medius kasının ön kenarı ile sınırlıdır. Tabanında ise 1. kaburga sınırı oluşturur. Brakiyal plexusun önünde Anterior skalen kasın üstünde frenik sinir

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**KAYNAKÇA**

1. Etienne J (1925) Regional anesthesia: its application in the surgical treatment of cancer of the breast (in French). Doctoral thesis, Faculty of Medicine, University of Paris.
2. Winnie AP. Interscalene brachial plexus block. *Anesth Analg* 1970;49: 455-466.
3. Pippa, P. Brachial plexus block using the posterior approach. *European Journal of Anaesthesiology*. 1990;7.5: 411-420.
4. Franco CD, Williams JM. Ultrasound-Guided Interscalene Block: Reevaluation of the "Stoplight" Sign and Clinical Implications. *Reg Anesth Pain Med*. 2016;41(4):452-459. Doi: 10.1097/AAP.0000000000000407
5. Gray H, Davies DV. (1969) Coupland RE. Gray's Anatomy Descriptive and Applied. 34th ed. London: Longmans
6. Erbüyün K, Çevikkalp E (2018). Periferik Sinir Blokları, Anesteziyoloji ve Reanimasyon Akademisi, Derman Tıbbi Yayıncılık.
7. Spence BC, Beach ML, Gallagher JD, et al. Ultrasound-guided interscalene blocks: understanding where to inject the local anaesthetic. *Anaesthesia*. 2011;66(6):509-514. Doi: 10.1111/j.1365-2044.2011.06712.x
8. Riaz S, Carmichael N, Awad I, et al. Effect of local anaesthetic volume (20 vs 5 ml) on the efficacy and respiratory consequences of ultrasound-guided interscalene brachial plexus block. *Br J Anaesth*. 2008;101(4):549-556. Doi: 10.1093/bja/aen229
9. Anthony P. Berg MD, Richard WR. Complications of peripheral nerve blocks. *Techniques in Regional Anesthesia and Pain Management*. 2007;11:133-140.
10. Kessler J, Schafhalter-Zoppoth I, Gray AT. An ultrasound study of the phrenic nerve in the posterior cervical triangle: implications for the interscalene brachial plexus block. *Reg Anesth Pain Med*. 2008;33(6):545-550.
11. Vorobeichik L, Brull R, Bowry R, et al. Should continuous rather than single-injection interscalene block be routinely offered for major shoulder surgery? A meta-analysis of the analgesic and side-effects profiles. *Br J Anaesth*. 2018;120(4):679-692. Doi: 10.1016/j.bja.2017.11.104
12. Thomas SE, Winchester JB, Hickman G, et al. A confirmed case of injury to the long thoracic nerve following a posterior approach to an interscalene nerve block. *Reg Anesth Pain Med*. 2013;38(4):370. Doi: 10.1097/AAP.0b013e3182905b98
13. Fredrickson MJ, Ball CM, Dalglish AJ. Posterior versus anterolateral approach interscalene catheter placement: a prospective randomized trial. *Reg Anesth Pain Med*. 2011;36(2):125-133. Doi: 10.1097/aap.0b013e31820d5ee6
14. Guo CW, Ma JX, Ma XL, et al. Supraclavicular block versus interscalene brachial plexus block for shoulder surgery: A meta-analysis of clinical control trials. *Int J Surg*. 2017;45:85-91. Doi: 10.1016/j.ijsu.2017.07.098
15. Zisquit J, Novella N, Nedeff N. Interscalene Block. In: StatPearls. Treasure Island (FL): StatPearls Publishing; June 1, 2020.
16. D'Souza RS, Johnson RL. Supraclavicular Block. In: StatPearls. Treasure Island (FL): StatPearls Publishing; August 15, 2020.
17. Kulenkampff D, Persky MA. Brachial plexus anesthesia. *Ann Surg*. 1928;87:883-891
18. Winnie AP, Collins V J. The subclavian perivascular technique of brachial plexus anesthesia. *Anesthesiology*, 1964, 25.3: 353-363. Doi: 10.1097/00000542-196405000-00014
19. Brown DL, Cahill DR, Bridenbaugh LD. Supraclavicular nerve block: anatomic analy-

- sis of a method to prevent pneumothorax. *Anesth Analg.* 1993;76(3):530-534. Doi: 10.1213/00000539-199303000-00013
20. Brown DL, Bridenbaugh LD. (1998). The upper extremity: somatic blockade. In: Cousins MJ, Bridenbaugh PO (Eds). *Neural Blockade.* (3rd ed., pp. 345-370) Philadelphia, PA: Lippincott-Raven.
  21. Arab SA, Alharbi MK, Nada EM, et al. Ultrasound-guided supraclavicular brachial plexus block: single versus triple injection technique for upper limb arteriovenous access surgery. *Anesth Analg.* 2014;118(5):1120-1125. Doi: 10.1213/ANE.0000000000000155
  22. Choudhary N, Kumar A, Kohli A, et al. Single-point versus double-point injection technique of ultrasound-guided supraclavicular block: A randomized controlled study. *J Anaesthesiol Clin Pharmacol.* 2019;35(3):373-378. Doi: 10.4103/joacp.JOACP\_144\_18
  23. Vermeylen K, Engelen S, Sermeus L, et al. Supraclavicular brachial plexus blocks: review and current practice. *Acta Anaesthesiol Belg.* 2012;63(1):15-21.
  24. Kim BG, Han JU, Song JH, et al. A comparison of ultrasound-guided interscalene and supraclavicular blocks for post-operative analgesia after shoulder surgery. *Acta Anaesthesiol Scand.* 2017;61(4):427-435. Doi: 10.1111/aas.12864
  25. Tran DQ, Russo G, Muñoz L, et al. A prospective, randomized comparison between ultrasound-guided supraclavicular, infraclavicular, and axillary brachial plexus blocks. *Reg Anesth Pain Med.* 2009 Jul-Aug;34(4):366-71. Doi: 10.1097/AAP.0b013e-3181ac7d18.
  26. Park SK, Lee SY, Kim WH, et al. Comparison of Supraclavicular and Infraclavicular Brachial Plexus Block: A Systemic Review of Randomized Controlled Trials. *Anesth Analg.* 2017;124(2):636-644. Doi: 10.1213/ANE.0000000000001713
  27. Williams LM, Cummings A. *Infraclavicular Nerve Block.* In: StatPearls. Treasure Island (FL): StatPearls Publishing; August 13, 2020.
  28. Bazy L, Blondin S. L'anesthésie du plexus brachial. *L'Anesthésie régionale.* Paris: Doin et Cie, 1917, 222-225.
  29. Raj PP, Montgomery SJ, Nettles D, et al. Infraclavicular brachial plexus block--a new approach. *Anesth Analg.* 1973;52(6):897-904.
  30. Whiffler K. Coracoid block--a safe and easy technique. *Br J Anaesth.* 1981;53(8):845-848. Doi: 10.1093/bja/53.8.845
  31. Kilka HG, Geiger P, Mehrkens HH. Die vertikale infraklavikuläre Blockade des Plexus brachialis. Eine neue Methode zur Anästhesie der oberen Extremität Eine anatomische und klinische Studie [Infraclavicular vertical brachial plexus blockade. A new method for anesthesia of the upper extremity. An anatomical and clinical study]. *Anaesthesist.* 1995;44(5):339-344. Doi: 10.1007/s001010050162
  32. Sharma D, Srivastava N, Pawar S, et al. Infraclavicular brachial plexus block: Comparison of posterior cord stimulation with lateral or medial cord stimulation, a prospective double blinded study. *Saudi J Anaesth.* 2013;7(2):134-137. Doi: 10.4103/1658-354X.114054
  33. Kavrut Ozturk N, Kavakli AS. Comparison of the coracoid and retroclavicular approaches for ultrasound-guided infraclavicular brachial plexus block. *J Anesth.* 2017;31(4):572-578. Doi: 10.1007/s00540-017-2359-6
  34. Beh ZY, Hasan MS. Ultrasound-guided costoclavicular approach infraclavicular brachial plexus block for vascular access surgery. *J Vasc Access.* 2017;18(5):e57-e61.

- Doi: 10.5301/jva.5000720
35. Karmakar MK, Sala-Blanch X, Songthamwat B, et al. Benefits of the costoclavicular space for ultrasound-guided infraclavicular brachial plexus block: description of a costoclavicular approach. *Reg Anesth Pain Med.* 2015;40(3):287-288. Doi: 10.1097/AAP.0000000000000232
  36. Leurcharumee P, Elgueta MF, Tiyaprasertkul W, et al. A randomized comparison between costoclavicular and paracoracoid ultrasound-guided infraclavicular block for upper limb surgery. *Can J Anaesth.* 2017;64(6):617-625. Doi: 10.1007/s12630-017-0842-z
  37. Brenner D, Iohom G, Mahon P, et al. Efficacy of axillary versus infraclavicular brachial plexus block in preventing tourniquet pain: A randomised trial. *Eur J Anaesthesiol.* 2019;36(1):48-54. Doi: 10.1097/EJA.0000000000000928
  38. Janjua MS, Pak A. Axillary Block. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; June 28, 2020.
  39. Hirschel G. Anesthesia of the brachial plexus for operations on the upper extremity. *Munchen Med Wochenschr*, 1911, 58: 1555-1556.
  40. Winnie AP, Radonjic R, Akkineni SR, et al. Factors influencing distribution of local anesthetic injected into the brachial plexus sheath. *Anesth Analg.* 1979;58(3):225-234.
  41. Thompson GE, Rorie DK. Functional anatomy of the brachial plexus sheaths. *Anesthesiology.* 1983;59(2):117-122. Doi: 10.1097/0000542-198308000-00009
  42. Klaastad Ø, Smedby O, Thompson GE, et al. Distribution of local anesthetic in axillary brachial plexus block: a clinical and magnetic resonance imaging study. *Anesthesiology.* 2002;96(6):1315-1324. Doi: 10.1097/0000542-200206000-00009
  43. Ambi U, Bhanupriya P, Hulkund SY, et al. Comparison between perivascular and perineural ultrasound-guided axillary brachial plexus block using levobupivacaine: A prospective, randomised clinical study. *Indian J Anaesth.* 2015;59(10):658-663. Doi: 10.4103/0019-5049.167476
  44. Ferraro LHC, Takeda A, Sousa PCCB, et al. Estudo prospectivo randomizado de três diferentes técnicas para o bloqueio do plexo braquial via axilar guiado por ultrassom [Randomized prospective study of three different techniques for ultrasound-guided axillary brachial plexus block]. *Rev Bras Anesthesiol.* 2018;68(1):62-68. Doi: 10.1016/j.bjan.2017.04.014
  45. Durrani MI, Dasgupta S. Radial Nerve Block. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; August 16, 2020.
  46. Pester JM, Bechmann S, Varacallo M. Median Nerve Block Techniques. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; July 31, 2020.
  47. Pester JM, Varacallo M. Ulnar Nerve Block Techniques. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; June 27, 2020.
  48. Wertheim HM, M.D. F.A.C.S., E. A. Rovenstine, M.D. Suprascapular Nerve Block. September 1941
  49. Harmon D, Hearty C. Ultrasound-guided suprascapular nerve block technique. *Pain Physician.* 2007;10(6):743-746.
  50. Auyong DB, Hanson NA, Joseph RS, et al. Comparison of Anterior Suprascapular, Supraclavicular, and Interscalene Nerve Block Approaches for Major Outpatient Arthroscopic Shoulder Surgery: A Randomized, Double-blind, Noninferiority Trial. *Anesthesiology.* 2018;129(1):47-57. Doi: 10.1097/ALN.0000000000002208

51. Neuts A, Stessel B, Wouters PF, et al. Selective Suprascapular and Axillary Nerve Block Versus Interscalene Plexus Block for Pain Control After Arthroscopic Shoulder Surgery: A Noninferiority Randomized Parallel-Controlled Clinical Trial. *Reg Anesth Pain Med.* 2018;43(7):738-744. Doi: 10.1097/AAP.0000000000000777
52. Pandit JJ, Dutta D, Morris JF. Spread of injectate with superficial cervical plexus block in humans: an anatomical study. *Br J Anaesth.* 2003;91(5):733-735. Doi: 10.1093/bja/aeg250
53. Kim JS, Ko JS, Bang S, et al. Cervical plexus block. *Korean J Anesthesiol.* 2018;71(4):274-288. Doi: 10.4097/kja.d.18.00143
54. Salvadores de Arzuaga CI, Naya Sieiro JM, Salmeron Zafra O, et al. Selective Low-Volume Nerve Block for the Open Surgical Fixation of a Midshaft Clavicle Fracture in a Conscious High-Risk Patient: A Case Report. *A A Case Rep.* 2017;8(11):304-306. Doi: 10.1213/XAA.0000000000000495
55. Dobie KH, Shi Y, Shotwell MS, et al. New technique targeting the C5 nerve root proximal to the traditional interscalene sonoanatomical approach is analgesic for outpatient arthroscopic shoulder surgery. *J Clin Anesth.* 2016;34:79-84. Doi: 10.1016/j.jclinane.2016.03.064
56. Chang KV, Lin CP, Wu WT, et al. Ultrasound-Guided Selective Cervical Root Injection for Postherpetic Neuralgia. *Am J Phys Med Rehabil.* 2017;96(10):e189-e190. Doi: 10.1097/PHM.0000000000000731
57. Wakeling C, Bateman A, Hatrick A, et al. Combined fluoroscopic and ultrasound guided cervical nerve root injections. *Int Orthop.* 2016;40(12):2547-2551. Doi: 10.1007/s00264-016-3224-1
58. Yu Q, Zheng E, Li X, et al. Ultrasound image guided lateral cervical approach to stellate ganglion block for cervical. *Neurosci Lett.* 2020;735:135139. Doi: 10.1016/j.neulet.2020.135139
59. Li X, Li MN, Cui XL, et al. Ultrasound-guided Selective Cervical Nerve Root Block Plus Superficial Cervical Plexus Block for Minimally Invasive Parathyroidectomy. *Zhongguo Yi Xue Ke Xue Yuan Xue Bao.* 2017;39(5):688-692. Doi: 10.3881/j.issn.1000-503X.2017.05.015
60. Kim E, Choi CH, Kim JH. Effects of C8 nerve root block during interscalene brachial plexus block on anesthesia of the posterior shoulder in patients undergoing arthroscopic shoulder surgery: study protocol for a prospective randomized parallel-group controlled trial. *Trials.* 2019;20(1):533. Doi: 10.1186/s13063-019-3624-9