

Bölüm 2

ADOLESAN VARİKOSEL

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Varikosel pleksus pampiniformisi oluşturan venlerin anormal genişlemesi olarak tanımlanır. İlk olarak A. Celsus tarafından milattan sonra 1. yüzyılda tanımlanmış 1843'te ise varikosel olarak adlandırılmıştır⁽¹⁾ Erkek popülasyonunun yaklaşık %15'inde görülür. Yaşla prevalansı artar, vücut kitle endeksi ile ters korelasyonu olduğu bildirilmiştir. Primer varikosel nedeni tam olarak belirlenemeyen varikosel olarak adlandırılırken sekonder varikosel dış basılara bağlı olarak gelişir. Sekonder varikoseller nadir görülürler. Retroperitoneal lenfadenopati gibi dışsal kitle, renal ven trombüsü gibi damar tıkanıkları veya splenorenal şant gibi testiküler vendeki basıncı arttıran patolojiler sonucu oluşabilir. Klinik varikosel fizik muayene ile teşhis edilebilirken, subklinik form sadece doppler ultrason ile teşhis edilebilir. Varikosel, primer infertiliteye sahip erkeklerin %19 - 41'ini, sekonder infertiliteye sahip erkeklerin %45 - 81'ini ve dispermi olan erkeklerin %30 - 45'ini etkileyen erkek infertilitesinin en yaygın düzeltilebilir nedenidir⁽²⁻⁴⁾. Varikosel genellikle 15 ile 25 yaşları arasında ortaya çıkar ve vakaların %78 -93'ünde solda tek taraflı, %2 - 20'sinde bilateral ve %1 - 7'sinde sağda tek taraflı görülebilir⁽⁵⁾ 4052 Türk çocuk ve ergenden oluşan bir kohort çalışmasında, prevalansı 2 - 6 yaş arası erkeklerde %0.8, 7 - 10 yaş arası erkeklerde %1, 11 - 14 yaş arası erkeklerde %7.8 ve 15 - 19 yaş arası erkeklerde %14.1 olarak bildirilmiştir.⁽⁶⁾Avrupa'da yapılan bir çalışmada ise adolesan varikosel prevalansı %15.7 olarak bildirilmiştir.⁽⁷⁾

1. ETİYOLOJİ

Varikosel gelişiminde iç spermatik ven kapaklarının konjenital yokluğu veya yetersizliği, vasküler bağ dokusunun konjenital anomalileri, sol spermatik venin uzunluğu, renal vene dik açıyla açılması, kremaster kasından ve iç ve dış kremasterik spermatik fasyalardan oluşan fizyolojik bir ünite olan fascio-musküler spermatik kord pompasındaki anormallikler, kremasterik kasın gelişimsel kusurları etiyojiden sorumlu tutulmaktadır. Varikoselin diğer nedenleri; spermatik venin dışsal sıkışması (adenopatiler veya yer kaplayan retroperitoneal kitleler), skrotumun konjenital atonisi sol renal venin sıkışmasından kaynaklanan renal ven ve

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la mikrocerrahi onarım yer alır. Alternatif olarak, skleroterapi veya embolizasyon cerrahi olmayan bir seçenek olarak kullanılabilir.⁽⁵⁹⁾ Semen analizi pediatrik hastalarda postoperatif bir değerlendirme olarak yapılmadığından testis büyüme hacmi, varikoselektominin sonuçlarını değerlendirmek için en önemli parametredir. Tedavi edilen hastalarda konservatif tedavi görenlere kıyasla testis hacminde ve sperm sayısında bir iyileşme olduğu ve bu verilerin çocukluk ve ergenlik döneminde varikozel onarımının faydalarını göstermektedir.⁽⁶⁵⁾ Anormal semen parametreleri için varikoselektomi geçiren erkeklerde %75 gebe kalma oranı bildirilmiştir.⁽⁶⁶⁾ Varikozel onarımından sonra inhibitör B seviyelerinde bir artış ve İnhibitör B ile FSH serum seviyeleri arasında negatif bir korelasyon bulunmuştur.⁽⁶⁷⁾ Cerrahi komplikasyonlar hidrosel, nüks oluşmasıdır. Hidrosel, lenfatik koruyucu olmayan laparoskopik cerrahi sonrası daha fazladır. Açık varikoselektomide nüks insidansı laparoskopik müdahalelerden daha yüksektir.⁽⁷¹⁻⁷⁶⁾

KAYNAKLAR

1. Noske HD, Weidner W. Varicocele a historical perspective. *World J Urol.* 1999; 17(3): 151-157 doi: 10.1007/s003450050123.
2. Di Bisceglie C, Fornengo R, Grosso M, Gazzera C, Mancini A, Andriani B, Lanfranco F, Brocato L, Gandini G, Manieri C. Follow-up of varicocele treated with percutaneous retrograde sclerotherapy: technical, clinical and seminal aspects. *J Endocrinol Invest*, 2003; 26(11): 1059-1064. doi: 10.1007/BF03345250.
3. Vanlangenhove P, Dhondt E, Everaert K, Defreyne L Pathophysiology, diagnosis and treatment of varicoceles: a review. *Minerva Urol Nefrol.* 2014; 66(4): 257-282
4. Agarwal A, Deepinder F, Cocuzza M, Agarwal R, Short RA, Sabanegh E, Marmar JL . Efficacy of varicocelectomy in improving semen parameters: new meta-analytical approach. *Urology.* 2007; 70(3): 532-538. doi: 10.1016/j.urology.2007.04.011.
5. Saypol DC. Varicocele. *J Androl.* 1981; 2: 61-71
6. Damsgaard J, Joensen U.N, Carlsen E, et al. Varicocele is associated with impaired semen quality and reproductive hormone levels: A study of 7035 healthy young men from six European countries. *Eur Urol.* 2016; 70(6); 1019-1029. doi: 10.1016/j.eururo.2016.06.044
7. Akbay E, Cayan S, Doruk E, et al. The prevalence of varicocele and varicocele-related testicular atrophy in Turkish children and adolescents. *BJU Int.* 2000; 86(4): 490-493. doi: 10.1046/j.1464-410x.2000.00735.x.
8. Shafik A. The cremasteric muscle. Role in varicoceleogenesis and in thermoregulatory function of the testicle. *Invest Urol.* 1973; 11: 92-97.
9. Sayfan J, Halevy A, Oland J, Nathan H. Varicocele and left renal vein compression. *Fertil Steril* 1984; 41(3): 411-417. doi: 10.1016/s0015-0282(16)47720-4.
10. Notkovich H. Testicular artery arching over renal vein: clinical and pathological considerations with special reference to varicocele. *Br J Urol.* 1955; 27(3): 267-271. doi: 10.1111/j.1464-410x.1955.tb03479.x.
11. Sayfan J, Adam YG, Soffer Y. A new entity in varicocele subfertility: the "cremasteric reflux". *Fertil Steril* 1980;33(1):88-90.doi: 10.1016/s0015-0282(16)44486-9.

12. Raman JD, Walmsley K, Goldstein M. Inheritance of varicoceles. *Urology*. 2005; 65(6): 1186–1189.
13. Beigi FM, Mehrabi S, Javaherforooshzadeh A. Varicocele in brothers of patients with varicocele. *Urol J (Tehran)*. 2007; 4(1): 33–35.
14. Dubin, L.; Amelar, R.D. Varicocele size and results of varicocelectomy in selected subfertile men with varicocele. *Fertil. Steril.* 1970; 21(8): 606–609. doi: 10.1016/s0015-0282(16)37684-1.
15. Diamond DA, Zurakowski D, Bauer SB, et al. Relationship of varicocele grade and testicular hypotrophy to semen parameters in adolescents. *J Urol* 2007; 178(4pt2):1 584–1588. doi: 10.1016/j.juro.2007.03.169.
16. De Sanctis V, Marsella M. Unilateral asymptomatic testis enlargement in children and adolescents. *Georgian Med News* 2011; 193: 25–29
17. Sakamoto H, Ogawa Y, Yoshida H. Relationship between testicular volume and testicular function: comparison of the Prader orchidometric and ultrasonographic measurements in patients with infertility. *Asian J Androl.* 2008; 10(2): 319-324. doi: 10.1111/j.1745-7262.2008.00340.x.
18. Diamond DA, Paltiel HJ, DiCanzio J, et al. Comparative assessment of pediatric testicular volume: orchidometer versus ultrasound. *J Urol.* 2000; 164(3pt2): 1111-1114. doi: 10.1097/00005392-200009020-00048.
19. Sakamoto H, Saito K, Shichizyo T, et al (2006) Color Doppler ultrasonography as a routine clinical examination in male infertility. *Int J Urol.* 2006; 13(8): 1073-1078. doi: 10.1111/j.1442-2042.2006.01499.x.
20. Trum JW, Gubler FM, Laan R, et al. The value of palpation, varicoscreen contact thermography and colour Doppler ultrasound in the diagnosis of varicocele. *Hum Reprod.* 1996; 11(6): 1232-1235. doi: 10.1093/oxfordjournals.humrep.a019362
21. Liguori G, Trombetta C, Garaffa G et al. (2004) Color Doppler ultrasound investigation of varicocele. *World J Urol.* 2004; 22(5): 378-381. doi: 10.1007/s00345-004-0421-0.
22. Jungwirth A, Giwercman A, Tournaye H, et al. European Association of Urology guidelines on Male Infertility: the 2012 update. *Eur Urol.* 2012; 62(2): 324-332. doi: 10.1016/j.eururo.2012.04.048
23. Practice Committee of the American Society for Reproductive M, Society for Male R, Urology. Report on varicocele and infertility: a committee opinion. *Fertil Steril.* 2014; 102(6): 1556-1560. doi: 10.1016/j.fertnstert.2014.10.007.
24. La Vignera S, Condorelli R, Vicari E, et al. Effects of varicocelectomy on sperm DNA fragmentation, mitochondrial function, chromatin condensation, and apoptosis. *J. Androl.* 2012; 33(3): 389-396. doi: 10.2164/jandrol.111.013433.
25. Hoekstra T, Witt MA. The correlation of internal spermatic vein palpability with ultrasonographic diameter and reversal of venous flow. *J Urol.* 1995;153(1): 82-84. doi: 10.1097/00005392-199501000-00029.
26. de Los Reyes T, Locke J, Afshar K. Varicoceles in the pediatric population: Diagnosis, treatment, and outcomes. *Can Urol Assoc J.* 2017 ; 11(1-2Suppl1): 34-39. doi: 10.5489/cuaj.4340
27. Agarwal A, Sharma RK, Desai NR, et al. Role of oxidative stress in pathogenesis of varicocele and infertility. *Urology.* 2009 ;73(3): 461-469. doi: 10.1016/j.urology.2008.07.053.
28. Fretz PC, Sandlow JI. Varicocele: current concepts in pathophysiology, diagnosis, and treatment. *Urol Clin North Am.* 2002; 29(4): 921-937. doi: 10.1016/s0094-0143(02)00075-7
29. Benoff S, Marmar JL, Hurley IR. Molecular and other predictors for infertility in patients with varicoceles. *Front Biosci (Landmark Ed).* 2009 1;14:3641-72. doi: 10.2741/3478. 30. Wright EJ, Young GP, Goldstein M. Reduction in testicular temperature after varicocelectomy in infertile men. *Urology.*1997 ; 50(2): 257-259. doi: 10.1016/s0090-4295(97)00191-x.

30. Shafik A. Thermoregulatory apparatus of the testicles. A review. *Urology*. 1974; 41: 473-478.
31. Hienz HA, Voggenthaler J, Weissbach L. Histological findings in testes with varicocele during childhood and their therapeutic consequences. *Eur J Pediatr*. 1980; 133(2): 139-146. doi: 10.1007/BF00441582
32. Zorngiotti AW, Macleod J. Studies in temperature, human semen quality, and varicocele. *Fertil Steril*. 1973; 24(11): 854-863.
33. Mieusset R, Bujan L. Testicular heating and its possible contributions to male infertility: a review. *Int J Androl*. 1995; 18(4): 169-184. doi: 10.1111/j.1365-2605.1995.tb00408.x
34. Simsek F, Turkeri L, Cevik I, et al. Role of apoptosis in testicular tissue damage caused by varicocele. *Arch Esp Urol*. 1998; 51(9): 947-950.
35. Netto NR Jr, Lemos GC, De Goes GM. Varicocele: relation between anoxia and hypospermatogenesis. *Int J Fertil*. 1977; 22(3): 174-178.
36. Steeno O, Knops J, Declerck L, et al. Prevention of fertility disorders by detection and treatment of varicocele at school and college age. *Andrologia*. 1976; 8(1): 47-53. doi: 10.1111/j.1439-0272.1976.tb01645.x.
37. Plymate SR, Paulsen CA, McLachlan RI. Relationship of serum inhibin levels to serum follicle stimulating hormone and sperm production in normal men and men with varicoceles. *J Clin Endocrinol Metab*. 1992; 74(4): 859-864. doi: 10.1210/jcem.74.4.1548351.
38. Yoshida KI, Nakame Y, Uchijima Y. Seminal plasma transferin concentration in normozoospermic fertile men and oligozoospermic men associated with varicocele. *Int J Fertil* 1988; 33(6): 432-436.
39. Hsu HS, Chang LS, Chen MT, et al. Decreased blood flow and defective energy metabolism in the varicocele-bearing testicles of rats. *Eur Urol*. 1994; 25(1): 71-75. doi: 10.1159/000475250
40. Hsu HS, Wei YH, Li AF, et al. Defective mitochondrial oxidative phosphorylation in varicocele-bearing testicles. *Urology*. 1995; 46(4): 545-549. doi: 10.1016/s0090-4295(99)80270-2.
41. Tarhan S, Gumus B, Gunduz I, et al. Effect of varicocele on testicular artery blood flow in men-color Doppler investigation. *Scand J Urol Nephrol*. 2003; 37(1): 38-42. doi: 10.1080/00365590310008677.
42. Griveau JF, Le Lannou D. Reactive oxygen species and human spermatozoa: physiology and pathology. *Int J Androl*. 1997; 20(2): 61-69. doi: 10.1046/j.1365-2605.1997.00044.x.
43. Klaiber EL, Broverman DM, Pokoly TB, et al. Interrelationships of cigarette smoking, testicular varicoceles, and seminal fluid indexes. *Fertil Steril*. 1987; 47(3): 481-486. doi: 10.1016/s0015-0282(16)59059-1.
44. Klaiber EL, Broverman DM, Vogel W. Increased incidence of testicular varicoceles in cigarette smokers. *Fertil Steril*. 1980; 34(1): 64-65. doi: 10.1016/s0015-0282(16)44842-9.
45. Jeng SY, Wu SM, Lee JD. Cadmium accumulation and metallothionein overexpression in internal spermatic vein of patients with varicocele. *Urology*. 2009; 73(6): 1231-1235. doi: 10.1016/j.urology.2009.01.008.
46. Hassanin AM, Ahmed HH, Kaddah ANA. Global view of the pathophysiology of varicocele. *Andrology*. 2018; 6(5): 654-661. doi: 10.1111/andr.12511
47. Baccetti B, Collodel G, Piomboni P. Apoptosis in human ejaculated sperm cells (notulae seminologicae 9). *J Submicrosc Cytol Pathol*. 1996; 28(4): 587-596.
48. Chiba K, Ramasamy R, Lamb DJ, et al. The varicocele: diagnostic dilemmas, therapeutic challenges and future perspectives. *Asian J Androl*. 2016; 18(2): 276-281. doi: 10.4103/1008-682X.167724.
49. Moursy EE, ElDahshoury MZ, Hussein MM, et al. Dilemma of adolescent varicocele: long term outcome in patients managed surgically and in patients managed expectantly. *J Pediatr Urol*. 2013; 9(6 Pt B):1018-1022. doi: 10.1016/j.jpuro.2013.01.017.

50. Goldstein M. Surgical management of male infertility. In: Wein AJ, Kavoussi LR, Novick AC, Partin AW, Peters CA, editors. Campbell-Walsh urology. Philadelphia: Elsevier Saunders; 2012; 648-687.
51. Kozakowski KA, Gjertson CK, Decastro GJ, et al. Peak retrograde flow: A novel predictor of persistent, progressive and new onset asymmetry in adolescent varicocele. *J. Urol.*2009; 181(6): 2717-2722; discussion 2723. doi: 10.1016/j.juro.2009.02.038.
52. Van Batavia JP, Badalato G, Fast A, et al. Adolescent varicocele-is the 20/38 harbinger a durable predictor of testicular asymmetry? *J. Urol.* .2013; 189(5): 1897-1901. doi: 10.1016/j.juro.2012.11.011.
53. Cimador M, Castagnetti M, Gattuccio I, et al. The hemodynamic approach to evaluating adolescent varicocele. *Nat. Rev. Urol.* 2012; 9(5): 247-257. doi: 10.1038/nrurol.2012.41.
54. Tanrikut C, Goldstein M, Rosoff JS, et al. Varicocele as a risk factor for androgen deficiency and effect of repair. *BJU Int.* . 2011; 108(9): 1480-1484. doi: 10.1111/j.1464-410X.2010.10030.x
55. Mehta A, Goldstein M. Microsurgical varicocelectomy: a review. *Asian J Androl.* 2013; 15(1): 56-60. doi: 10.1038/aja.2012.98
56. Kolon TF, Clement MR, Cartwright L, et al. Transient asynchronous testicular growth in adolescent males with a varicocele. *J. Urol.* 2008; 180(3): 1111-1114; discussion 1114-1115. doi: 10.1016/j.juro.2008.05.061.
57. Glassberg KI. My indications for treatment of the adolescent varicocele (and why?). *Trans. Androl. Urol.* 2014; 3(4): 402-412. doi: 10.3978/j.issn.2223-4683.2014.12.09.
58. Diamond DA, Gargollo PC, Caldamone AA. Current management principles for adolescent varicocele. *Fertil Steril.* 2011; 96(6): 1294-1298. doi: 10.1016/j.fertnstert.2011.10.034.
59. Harel M, Herbst KW, Nelson E. Practice patterns in the surgical approach for adolescent varicocelectomy. *Springerplus.* 2015;1 4;(4): 772. doi: 10.1186/s40064-015-1573-1577.
60. Zampieri N, Cervellione RM. Varicocele in adolescents: a 6-year longitudinal and followup observational study. *J Urol.* .2008; 180(4 Suppl): 1653-1656; discussion 1656. doi: 10.1016/j.juro.2008.03.114
61. Fast AM, Deibert CM, Van Batavia JP, et al. Adolescent varicocelectomy: does artery sparing influence recurrence rate and/or catch-up growth? *Andrology.* 2014; 2(2): 159-164. doi: 10.1111/j.2047-2927.2013.00142.x
62. Mehta A, Goldstein M. Microsurgical varicocelectomy: a review. *Asian J Androl.* .2013 ;15(1): 56-60. doi: 10.1038/aja.2012.98.
63. Diamond DA, Gargollo PC, Caldamone AA. Current management principles for adolescent varicocele. *Fertil Steril.* 2011; 96(6): 1294-1298. doi: 10.1016/j.fertnstert.2011.10.034
64. Locke, J.A.;Maryam, N.; Kourosh, A. Treatment of varicocele in children and adolescents: A systematic review and meta-analysis of randomized controlled trials. *J. Pediatr. Urol.*2017; 13(5): 437-445. doi: 10.1016/j.jpuro.2017.07.008.
65. Pajovic B, Radojevic N. Prospective follow up of fertility after adolescent laparoscopic varicocelectomy. *Eur Rev Med Pharmacol Sci.* 2013; 17(8): 1060-1063.
66. Niu XB,Tang J, Wang HB et al. Inhibin B level helps evaluate the testicular function of prepubertal patients with varicocele. *Zhonghua Nan KeXue.* 2018; 24(7): 618-621.
67. Kim SO, Jung H, Park K. Outcomes of microsurgical subinguinal varicocelectomy for painful varicoceles. *J Androl.* 2012; 33(5): 872-875. doi: 10.2164/jandrol.111.014993.
68. Park HJ, Lee SS, Park NC. Predictors of pain resolution after varicocelectomy for painful varicocele. *Asian J Androl.* 2011; 13(5): 754-758. doi: 10.1038/aja.2010.87
69. Kim HT, Song PH, Moon KH. Microsurgical ligation for painful varicocele: effectiveness and predictors of pain resolution. *Yonsei Med J.* .2012; 53(1): 145-150. doi: 10.3349/ymj.2012.53.1.145.

70. Paduch DA, Niedzielski J. Repair versus observation in adolescent varicocele: a prospective study. *J Urol.* 1997;158(3 Pt 2): 1128-1132. doi: 10.1097/00005392-199709000-00111
71. Golebiewski A, Krolak M, Komasa L, et al. Dye-assisted lymph vessels sparing laparoscopic varicoectomy. *J Laparoendosc Adv Surg Tech A.* 2007;17(3): 360-363. doi: 10.1089/lap.2006.0072
72. Niu ZS, Hao CS, Ye H, et al. Transumbilical single-site single-port versus single-site double-port laparoscopic varicoectomy for varicocele in adolescents. *Zhonghua Nan Ke Xue* 2014; 20(4): 342-346 [Article in Chinese].
73. Podkamenev VV, Stalmakhovich VN, Urkov PS, et al. Laparoscopic surgery for pediatric varicoceles: randomized controlled trial. *J Pediatr Surg.* 2002; 37(5): 727-729. doi: 10.1053/jpsu.2002.32264.
74. Zampieri N, Zuin V, Corroppo M, et al. Varicocele and adolescents: semen quality after 2 different laparoscopic procedures. *J Androl.* 2007 ;28(5): 727-733. doi: 10.2164/jandrol.107.002600
75. Pajovic B, Radojevic N. Prospective follow up of fertility after adolescent laparoscopic varicoectomy. *Eur Rev Med Pharmacol Sci.* 2013; 17(8): 1060-1063.