

## Bölüm 9

# ÇOCUKLUK ÇAĞI VE ADÖLESAN VARİKOSEL

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## GİRİŞ

Varikosel panpiniform pleksus içerisindeki internal spermatik venlerin venöz reflüye bağlı olarak anormal dilatasyonu ve tortiyositesidir (1). Antik çağlardan beri bilinen varikoselin ilk kez birinci yüzyılda skrotal cilt üzerinden dağlanarak tedavi edildiği ortaya çıkarılmıştır (2). Varikosel Fransız cerrah Pare tarafından “kan ile dolu damar demeti” şeklinde tanımlanmış olup, aynı hekimin “koyu venöz kan akışının genişlemiş, uzun kıvrımlar halinde durgunlaşması” ifadesiyle muhtemelen ilk kez zararlı etkilerine vurgu yapılmıştır (3). Yine benzer dönemler de Şerafettin Sabuncuoğlu ise varikoselin altında yatan etkenin “kirli kan” olduğunu düşünmüştür (4). 19. yüzyıla kadar skrotal ağrı cerrahi endikasyon olarak görünürken, 1950’li yıllarda varikosel ile fertilité arasındaki ilişki keşfedilmeye başlanmıştır (2, 5). Varikosel adölesan dönemde sıklıkla skrotal ağrı ve şişlik, testis boyutlarında küçülme, bozulmuş sperm parametreleri ile ilişkili olup gelecekte fertilité bozukluklarına neden olabilen bir patolojidir.

## EPİDEMİYOLOJİ

Varikosel 10 yaş altı nadir görülmekle beraber yaklaşık insidansı %1’dir. Ancak puberte ile birlikte görülme sıklığı artar (6). Pubertede insidansı yetişkin dönem ile benzer olup %10-15 arası raporlanmıştır (6-8). Prevelansının birinci derece akrabalarında olduğu bilinen kişilerde arttığı bilinmektedir. Sıklığı ile şiddeti yaşı ve Tanner evresine göre değişebilmektedir. Varikosel puberte döneminde ve Tanner evre 3’te pik yapmaktadır (7). Primer infertilitesi olan erkekler de insidansının %40’lara, sekonder infertilitesi olanlarda da %81’ e kadar ulaştığı bildirilmiştir (9, 10).

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rağmen gelecekteki fertilité ve gebelik oranları üzerine etkisi halen tartışmalıdır.

## KAYNAKÇA

1. Partin AW, Dmochowski RR, Kavoussi LR, Peters CA, Wein AJ. Campbell walsh wein urology: 3-volume set: Elsevier Health Sciences; 2020.
2. Papavramidou NS, Christopoulou-Aletras H. Treatment of “hernia” in the writings of Celsus (first century AD). *World J Surg.* 2005;29(10):1343-7.
3. Nöske HD, Weidner W. Varicocele--a historical perspective. *World J Urol.* 1999;17(3):151-7.
4. Kendirci M, Kadioğlu A, Boylu U, Miroğlu C. Urogenital surgery of the 15th century in Anatolia. *J Urol.* 2005;173(6):1879-82.
5. Sack BS, Schäfer M, Kurtz MP. The Dilemma of Adolescent Varicoceles: Do They Really Have to Be Repaired? *Curr Urol Rep.* 2017;18(5):38.
6. Akbay E, Cayan S, Doruk E, Duce MN, Bozlu M. The prevalence of varicocele and varicocele-related testicular atrophy in Turkish children and adolescents. *BJU Int.* 2000;86(4):490-3.
7. Kumanov P, Robeva RN, Tomova A. Adolescent varicocele: who is at risk? *Pediatrics.* 2008;121(1):e53-7.
8. Niedzielski J, Paduch D, Raczyński P. Assessment of adolescent varicocele. *Pediatr Surg Int.* 1997;12(5-6):410-3.
9. The influence of varicocele on parameters of fertility in a large group of men presenting to infertility clinics. World Health Organization. *Fertil Steril.* 1992;57(6):1289-93.
10. Bogaert G, Orye C, De Win G. Pubertal screening and treatment for varicocele do not improve chance of paternity as adult. *J Urol.* 2013;189(6):2298-303.
11. Cervellione RM, Corroppolo M, Bianchi A. Subclinical varicocele in the pediatric age group. *J Urol.* 2008;179(2):717-9; discussion 9.
12. Pfeiffer D, Berger J, Schoop C, Tauber R. A Doppler-based study on the prevalence of varicocele in German children and adolescents. *Andrologia.* 2006;38(1):13-9.
13. Stassen CM, Weil EH, Janevski BK. Left renal vein compression syndrome (“nutcracker phenomenon”). *Rofo.* 1989;150(6):708-10.
14. 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):S34-s9.
15. Bae K, Shin HS, Jung HJ, Kang SH, Jin BS, Park JS. Adolescent varicocele: are somato-metric parameters a cause? *Korean J Urol.* 2014;55(8):533-5.
16. Handel LN, Shetty R, Sigman M. The relationship between varicoceles and obesity. *J Urol.* 2006;176(5):2138-40; discussion 40.
17. Nistal M, Paniagua R, González-Peramato P, Reyes-Múgica M. Perspectives in Pediatric Pathology, Chapter 20. Adolescent Varicocele. *Pediatr Dev Pathol.* 2016;19(5):360-70.
18. Wright EJ, Young GP, Goldstein M. Reduction in testicular temperature after varicocelectomy in infertile men. *Urology.* 1997;50(2):257-9.
19. Simşek F, Türkeri L, Cevik I, Bircan K, Akdaş A. Role of apoptosis in testicular tissue damage caused by varicocele. *Arch Esp Urol.* 1998;51(9):947-50.
20. Zorgnotti AW, Macleod J. Studies in temperature, human semen quality, and varicocele. *Fertil Steril.* 1973;24(11):854-63.

21. Fujisawa M, Yoshida S, Matsumoto O, Kojima K, Kamidono S. Deoxyribonucleic acid polymerase activity in the testes of infertile men with varicocele. *Fertil Steril.* 1988;50(5):795-800.
22. Yin Y, Hawkins KL, DeWolf WC, Morgentaler A. Heat stress causes testicular germ cell apoptosis in adult mice. *J Androl.* 1997;18(2):159-65.
23. Steeno Ö, Knops J, Declerck L, Adimoelja A, van de Voorde H. Prevention of fertility disorders by detection and treatment of varicocele at school and college age. *Andrologia.* 1976;8(1):47-53.
24. Ozbek E, Yurekli M, Soylu A, Davarci M, Balbay MD. The role of adrenomedullin in varicocele and impotence. *BJU Int.* 2000;86(6):694-8.
25. Belmonte IG, Martín de Serrano MN. Partial obstruction of the seminal path, a frequent cause of oligozoospermia in men. *Hum Reprod.* 1998;13(12):3402-5.
26. Nistal M, Paniagua R, Regadera J, Santamaría L. Obstruction of the tubuli recti and ductuli efferentes by dilated veins in the testes of men with varicocele and its possible role in causing atrophy of the seminiferous tubules. *Int J Androl.* 1984;7(4):309-23.
27. Tarhan S, Gümüs B, Gündüz I, Ayyıldız V, Göktan C. Effect of varicocele on testicular artery blood flow in men--color Doppler investigation. *Scand J Urol Nephrol.* 2003;37(1):38-42.
28. Hsu HS, Chang LS, Chen MT, Wei YH. Decreased blood flow and defective energy metabolism in the varicocele-bearing testicles of rats. *Eur Urol.* 1994;25(1):71-5.
29. Griveau JF, Le Lannou D. Reactive oxygen species and human spermatozoa: physiology and pathology. *Int J Androl.* 1997;20(2):61-9.
30. Baccetti B, Collodel G, Piomboni P. Apoptosis in human ejaculated sperm cells (notulae seminologicae 9). *J Submicrosc Cytol Pathol.* 1996;28(4):587-96.
31. Goldstein M, Eid JF. Elevation of intratesticular and scrotal skin surface temperature in men with varicocele. *J Urol.* 1989;142(3):743-5.
32. Zampieri N, Ottolenghi A, Camoglio FS. Painful varicocele in pediatric age: is there a correlation between pain, testicular damage and hormonal values to justify surgery? *Pediatr Surg Int.* 2008;24(11):1235-8.
33. Chung JM, Lee SD. Current Issues in Adolescent Varicocele: Pediatric Urological Perspectives. *World J Mens Health.* 2018;36(2):123-31.
34. Dubin L, Amelar RD. Varicocele size and results of varicocelectomy in selected subfertile men with varicocele. *Fertil Steril.* 1970;21(8):606-9.
35. Diamond DA, Paltiel HJ, DiCanzio J, Zurakowski D, Bauer SB, Atala A, et al. Comparative assessment of pediatric testicular volume: orchidometer versus ultrasound. *J Urol.* 2000;164(3 Pt 2):1111-4.
36. C. Radmayr, G. Bogaert, B. Burgu, M.S. Castagnetti, H.S. Dogan, F. O'Kelly, et al. Varicocele in children and adolescents. EAU Guidelines on Paediatric Urology. 2023:33-6.
37. Sakamoto H, Saito K, Oohta M, Inoue K, Ogawa Y, Yoshida H. Testicular volume measurement: comparison of ultrasonography, orchidometry, and water displacement. *Urology.* 2007;69(1):152-7.
38. Diamond DA, Zurakowski D, Bauer SB, Borer JG, Peters CA, Cilento BG, Jr., et al. Relationship of varicocele grade and testicular hypotrophy to semen parameters in adolescents. *J Urol.* 2007;178(4 Pt 2):1584-8.

39. Kolon TF, Clement MR, Cartwright L, Bellah R, Carr MC, Canning DA, et al. Transient asynchronous testicular growth in adolescent males with a varicocele. *J Urol.* 2008;180(3):1111-4; discussion 4-5.
40. Skoog SJ, Roberts KP, Goldstein M, Pryor JL. The adolescent varicocele: what's new with an old problem in young patients? *Pediatrics.* 1997;100(1):112-21.
41. Schiff JD, Li PS, Goldstein M. Correlation of ultrasound-measured venous size and reversal of flow with Valsalva with improvement in semen-analysis parameters after varicocelectomy. *Fertil Steril.* 2006;86(1):250-2.
42. Kozakowski KA, Gjertson CK, Decastro GJ, Poon S, Gasalberti A, Glassberg KI. Peak retrograde flow: a novel predictor of persistent, progressive and new onset asymmetry in adolescent varicocele. *J Urol.* 2009;181(6):2717-22; discussion 23.
43. Van Batavia JP, Badalato G, Fast A, Glassberg KI. Adolescent varicocele-is the 20/38 harbinger a durable predictor of testicular asymmetry? *J Urol.* 2013;189(5):1897-901.
44. Janczewski Z, Bablok L. Semen characteristics in pubertal boys. III. Semen quality and somatosexual development. *Arch Androl.* 1985;15(2-3):213-8.
45. Moursy EE, ElDahshoury MZ, Hussein MM, Mourad MZ, Badawy AA. Dilemma of adolescent varicocele: long-term outcome in patients managed surgically and in patients managed expectantly. *J Pediatr Urol.* 2013;9(6 Pt B):1018-22.
46. Chu DI, Zderic SA, Shukla AR, Srinivasan AK, Tasian GE, Weiss DA, et al. The natural history of semen parameters in untreated asymptomatic adolescent varicocele patients: A retrospective cohort study. *J Pediatr Urol.* 2017;13(1):77.e1-e5.
47. Kurtz MP, Zurakowski D, Rosoklija I, Bauer SB, Borer JG, Johnson KL, et al. Semen parameters in adolescents with varicocele: association with testis volume differential and total testis volume. *J Urol.* 2015;193(5 Suppl):1843-7.
48. Chu DI, Zderic SA, Shukla AR, Srinivasan AK, Tasian GE, Weiss DA, et al. Does varicocelectomy improve semen analysis outcomes in adolescents without testicular asymmetry? *J Pediatr Urol.* 2017;13(1):76.e1-e5.
49. Kurtz MP, Rosoklija I, Kringle G, Zurakowski D, Yu RN, Diamond DA. Prepubertal presentation of varicocele does not affect outcomes. *J Pediatr Urol.* 2015;11(2):73.e1-4.
50. Keene DJ, Fitzgerald CT, Cervellione RM. Sperm concentration and forward motility are not correlated with age in adolescents with an idiopathic varicocele and symmetrical testicular volumes. *J Pediatr Surg.* 2016;51(2):293-5.
51. Abrol N, Panda A, Kekre NS. Painful varicoceles: Role of varicocelectomy. *Indian J Urol.* 2014;30(4):369-73.
52. Van Batavia JP, Woldu SL, Raimondi PM, Spencer BA, Insel BJ, Poon SA, et al. Adolescent varicocele: influence of Tanner stage at presentation on the presence, development, worsening and/or improvement of testicular hypotrophy without surgical intervention. *J Urol.* 2010;184(4 Suppl):1727-32.
53. Çayan S, Bozlu M, Akbay E. Update on the novel management and future paternity situation in adolescents with varicocele. *Turk J Urol.* 2017;43(3):241-6.
54. Diamond DA, Xuewu J, Cilento BG, Jr., Bauer SB, Peters CA, Borer JG, et al. Varicocele surgery: a decade's experience at a children's hospital. *BJU Int.* 2009;104(2):246-9.
55. Lurvey R, Durbin-Johnson B, Kurzrock EA. Adolescent varicocele: A large multicenter analysis of complications and recurrence in academic programs. *J Pediatr Urol.* 2015;11(4):186.e1-6.

56. Barroso U, Jr., Andrade DM, Novaes H, Netto JM, Andrade J. Surgical treatment of varicocele in children with open and laparoscopic Palomo technique: a systematic review of the literature. *J Urol.* 2009;181(6):2724-8.
57. Zampieri N, Cervellione RM. Varicocele in adolescents: a 6-year longitudinal and followup observational study. *J Urol.* 2008;180(4 Suppl):1653-6; discussion 6.
58. Sinanoglu O, Eyyupoglu SE, Ekici S. Ipsilateral testicular catch-up growth rate following microsurgical inguinal adolescent varicocelectomy. *ScientificWorldJournal.* 2012;2012:356374.
59. Fast AM, Deibert CM, Van Batavia JP, Nees SN, Glassberg KI. Adolescent varicocelectomy: does artery sparing influence recurrence rate and/or catch-up growth? *Andrology.* 2014;2(2):159-64.
60. Silay MS, Hoen L, Quadackaers J, Undre S, Bogaert G, Dogan HS, et al. Treatment of Varicocele in Children and Adolescents: A Systematic Review and Meta-analysis from the European Association of Urology/European Society for Paediatric Urology Guidelines Panel. *Eur Urol.* 2019;75(3):448-61.
61. Zhou T, Zhang W, Chen Q, Li L, Cao H, Xu CL, et al. Effect of varicocelectomy on testis volume and semen parameters in adolescents: a meta-analysis. *Asian J Androl.* 2015;17(6):1012-6.
62. Diamond DA, Gargollo PC, Caldamone AA. Current management principles for adolescent varicocele. *Fertil Steril.* 2011;96(6):1294-8.
63. Li F, Chiba K, Yamaguchi K, Okada K, Matsushita K, Ando M, et al. Effect of varicocelectomy on testicular volume in children and adolescents: a meta-analysis. *Urology.* 2012;79(6):1340-5.
64. Shiraishi K, Oka S, Matsuyama H. Surgical comparison of subinguinal and high inguinal microsurgical varicocelectomy for adolescent varicocele. *Int J Urol.* 2016;23(4):338-42.
65. Lacerda JI, Del Giudice PT, da Silva BF, Nichi M, Fariello RM, Fraietta R, et al. Adolescent varicocele: improved sperm function after varicocelectomy. *Fertil Steril.* 2011;95(3):994-9.
66. Cayan S, Kadioglu A, Orhan I, Kandirali E, Tefekli A, Tellaloglu S. The effect of microsurgical varicocelectomy on serum follicle stimulating hormone, testosterone and free testosterone levels in infertile men with varicocele. *BJU Int.* 1999;84(9):1046-9.
67. Samplaski MK, Jarvi KA. Prognostic factors for a favorable outcome after varicocele repair in adolescents and adults. *Asian J Androl.* 2016;18(2):217-21.
68. Scherr D, Goldstein M. Comparison of bilateral versus unilateral varicocelectomy in men with palpable bilateral varicoceles. *J Urol.* 1999;162(1):85-8.
69. Libman J, Jarvi K, Lo K, Zini A. Beneficial effect of microsurgical varicocelectomy is superior for men with bilateral versus unilateral repair. *J Urol.* 2006;176(6 Pt 1):2602-5; discussion 5.
70. Marks JL, McMahon R, Lipshultz LI. Predictive parameters of successful varicocele repair. *J Urol.* 1986;136(3):609-12.
71. Steckel J, Dicker AP, Goldstein M. Relationship between varicocele size and response to varicocelectomy. *J Urol.* 1993;149(4):769-71.
72. Samplaski MK, Yu C, Kattan MW, Lo KC, Grober ED, Zini A, et al. Nomograms for predicting changes in semen parameters in infertile men after varicocele repair. *Fertil Steril.* 2014;102(1):68-74.

73. Cantoro U, Catanzariti F, Lacetera V, Quaresima L, Giovanni M, Polito M. Percentage change of FSH value: new variable to predict the seminal outcome after varicocelectomy. *Andrologia*. 2015;47(4):412-6.
74. Kondo Y, Ishikawa T, Yamaguchi K, Fujisawa M. Predictors of improved seminal characteristics by varicocele repair. *Andrologia*. 2009;41(1):20-3.
75. Hassanzadeh-Nokashty K, Yavarikia P, Ghaffari A, Hazhir S, Hassanzadeh M. Effect of age on semen parameters in infertile men after varicocelectomy. *Ther Clin Risk Manag*. 2011;7:333-6.
76. Chen SS. Predictive factors of successful redo varicocelectomy in infertile patients with recurrent varicocele. *Andrologia*. 2014;46(7):738-43.
77. Chen SS, Chen LK. Predictive factors of successful varicocelectomy in infertile patients. *Urol Int*. 2011;86(3):320-4.
78. Shindel AW, Yan Y, Naughton CK. Does the number and size of veins ligated at left-sided microsurgical subinguinal varicocelectomy affect semen analysis outcomes? *Urology*. 2007;69(6):1176-80.
79. Pasqualotto FF, Lucon AM, de Góes PM, Sobreiro BP, Hallak J, Pasqualotto EB, et al. Relationship between the number of veins ligated in a varicocelectomy with testicular volume, hormonal levels and semen parameters outcome. *J Assist Reprod Genet*. 2005;22(6):245-9.
80. Baker K, McGill J, Sharma R, Agarwal A, Sabanegh E, Jr. Pregnancy after varicocelectomy: impact of postoperative motility and DFI. *Urology*. 2013;81(4):760-6.
81. Li F, Yamaguchi K, Okada K, Matsushita K, Ando M, Chiba K, et al. Significant improvement of sperm DNA quality after microsurgical repair of varicocele. *Syst Biol Reprod Med*. 2012;58(5):274-7.
82. Kadioglu TC, Aliyev E, Celik M. Microscopic varicocelectomy significantly decreases the sperm DNA fragmentation index in patients with infertility. *Biomed Res Int*. 2014;2014:695713.
83. Casey JT, Misseri R. Adolescent Varicoceles and Infertility. *Endocrinol Metab Clin North Am*. 2015;44(4):835-42.
84. Kamal KM, Jarvi K, Zini A. Microsurgical varicocelectomy in the era of assisted reproductive technology: influence of initial semen quality on pregnancy rates. *Fertil Steril*. 2001;75(5):1013-6.
85. Çayan S, Şahin S, Akbay E. Paternity Rates and Time to Conception in Adolescents with Varicocele Undergoing Microsurgical Varicocele Repair vs Observation Only: A Single Institution Experience with 408 Patients. *J Urol*. 2017;198(1):195-201.
86. Locke JA, Noparast M, Afshar K. Treatment of varicocele in children and adolescents: A systematic review and meta-analysis of randomized controlled trials. *J Pediatr Urol*. 2017;13(5):437-45.