

BÖLÜM 30

FİSTÜL KOMPLİKASYONLARI

Rıdvan GÖKAY¹

GİRİŞ

Fistül, epitelize iki boşluk veya organ arasındaki anormal bağlantıdır. Tüm fistüllerde ortak olan komplikasyonlar enfeksiyon ve sıvı kaybıdır.

Farklı organ sistemlerinden kaynaklanan fistüllerin çok farklı çıktıları olacaktır. Elektrolit ve beslenme kayipları, orijin organları arasında büyük farklılıklar gösterebilir. Örnek olarak, mide sıvısı daha yüksek bir asiditeye sahiptir. Bu bilgi enterokutan fistüllerin tedavisinde gerekli olabilir.

Sıvı elektrolit kayiplarının tespitinin yapılması, enfeksiyon için kültür örneği almak önemlidir.

Fistülün yerine göre farklı komplikasyonlar bulunmaktadır. Alt başlıklar halinde en çok görülen fistüllerin komplikasyonlarından bahsedilecektir.

BRONKOPELVRAL FİSTÜL

Ana gövde, lober veya segmental bronş ile plevral boşluk arasındaki patolojik bağlantıya bronkoplevral fistül (BPF) adı verilir. BPF'li hastalar akut tansiyon pnömotoraks semptomlarından ampiyemin subakut semptomlarına kadar değişen semptomlarla başvurabilirler.

¹ Op. Dr., Kırklareli Lüleburgaz Devlet Hastanesi, Genel Cerrahi Kliniği, ridvangozay@gmail.com

fekal kirlenmesi de yaygın şikayetlerdir. Bu semptomlar, hastanın bağırsak hareketleri gevşek olduğunda daha belirgin olabilir. Bazen küçük bir fistül asemptomatik olabilir.

AVF olduğundan şüphelenilen hastalar, aciliyetle ilişkili fekal inkontinansın yanı sıra fekal aciliyet semptomları hakkında da sorgulanmalıdır. Bu ek semptomlar genellikle dış anal sfinkterin bozulmasını düşündürür.

ÜROGENİTAL FİSTÜLLER

Ürogenital fistüller, kadın genital sistemi ile mesane, üretra veya üreterler arasındaki anormal iletişimlerdir. İdrar yolu ile vajina arasındaki fistüller tipik olarak vajinadan ağrısız idrar kaçığı ile sonuçlanır. Aralıklı sizıntı, özellikle pozisyonel olduğunda, üreterovajinal fistülün bir işaretini olabilirken, sürekli idrar kaybı daha çok vezikovajinal fistüllerin karakteristiğidir.

ANOREKTAL FİSTÜLLER

Anorektal fistül, anal apse oluşturan akut perirektal sürecin kronik tezahüridür (68). Apse spontan drene olduğunda veya boşaltıldığında, anüs veya rektumdaki apseyi perirektal deri ile birleştiren epitelize bir iz oluşabilir (69). Anorektal rahatsızlık genellikle semptomatik hemoroidlere atfedildiğinden, anal fistüllerin gerçek prevalansı bilinmemektedir. Anal apseden gelişen anal fistül insidansı yüzde 15 ila 38 arasında değişmektedir (70-74).

Anorektal fistülü olan hastalar genellikle drenajı takiben “iyileşmeyen” anorektal apse veya kronik pürülen drenaj ve perianal veya kalça bölgesinde püstül benzeri lezyon ile başvururlar. Hastalar, özellikle dışkılama sırasında, ayrıca oturma ve aktivite sırasında aralıklı rektal ağrı yaşayabilir. Hastalar ayrıca aralıklı ve kötü kokulu perianal drenaj ve kaşıntı yaşayabilir (78).

KAYNAKLAR

1. Bronchopleural fistulas: an overview of the problem with special focus on endoscopic management. Lois M, Noppen M *Chest*. 2005;128(6):3955.
2. Methods for the postoperative management of the thoracic oncology patients: lessons from the clinic. Leuzzi G, Facciolo F, Pastorino U, Rocco G *Expert Rev Respir Med*. 2015;9(6):751. Epub 2015 Nov 4.
3. Ricci ZJ, Haramati LB, Rosenbaum AT, Liebling MS. Role of computed tomography in guiding the management of peripheral bronchopleural fistula. *J Thorac Imaging*. 2002



- Jul;17(3):214-8. doi: 10.1097/00005382-200207000-00006. PMID: 12082373.
- 4. Merritt RE, Reznik SI, DaSilva MC, Sugarbaker DJ, Whyte RI, Donahue DM, Hoang CD, Smythe WR, Shrager JB. Benign emptying of the postpneumonectomy space. *Ann Thorac Surg.* 2011 Sep;92(3):1076-81; discussion 1081-2. doi: 10.1016/j.athoracsur.2011.04.082. PMID: 21871304.
 - 5. Reed MF, Mathisen DJ. Tracheoesophageal fistula. *Chest Surg Clin N Am.* 2003 May;13(2):271-89. doi: 10.1016/s1052-3359(03)00030-9. PMID: 12755313.
 - 6. Chen YH, Li SH, Chiu YC, Lu HI, Huang CH, Rau KM, Liu CT. Comparative study of esophageal stent and feeding gastrostomy/jejunostomy for tracheoesophageal fistula caused by esophageal squamous cell carcinoma. *PLoS One.* 2012;7(8):e42766. doi: 10.1371/journal.pone.0042766. Epub 2012 Aug 13. PMID: 22912737; PMCID: PMC3418295.
 - 7. Balazs A, Kupcsulik PK, Galambos Z. Esophagorespiratory fistulas of tumorous origin. Non-operative management of 264 cases in a 20-year period. *Eur J Cardiothorac Surg.* 2008 Nov;34(5):1103-7. doi: 10.1016/j.ejcts.2008.06.025. Epub 2008 Aug 3. PMID: 18678504.
 - 8. Rodriguez AN, Diaz-Jimenez JP. Malignant respiratory-digestive fistulas. *Curr Opin Pulm Med.* 2010 Jul;16(4):329-33. doi: 10.1097/MCP.0b013e3283390de8. PMID: 20531081.
 - 9. Coexisting aortocolic and aortovesical fistulæ in an abdominal aortic aneurysm: report of a case. Kang SJ, Kim DI, Huh SH, Lee BB, Kim DK, Do YS *Surg Today.* 2003;33(6):441-3.
 - 10. Simultaneous manifestation of an aortocaval and aortoduodenal fistula. Bengisun U, Alacayir I, Karayalçın K, Köksoy C, Tüzüner A *Vasa.* 1996;25(1):81-3.
 - 11. Ureteral perigraft fistula. Deem S, Stone P, Schlarb C *Vasc Endovascular Surg.* 2007 Aug-Sep;41(4):352-4.
 - 12. Gastrointestinal tract involvement by prosthetic graft infection. The significance of gastrointestinal hemorrhage. Reilly LM, Ehrenfeld WK, Goldstone J, Stoney RJ *Ann Surg.* 1985 Sep;202(3):342-8.
 - 13. Diagnosis and management of aortoenteric fistulas. Busuttil SJ, Goldstone J Semin *Vasc Surg.* 2001 Dec;14(4):302-11.
 - 14. Late results following surgical management of vascular graft infection. Reilly LM, Altman H, Lusby RJ, Kersh RA, Ehrenfeld WK, Stoney RJ *J Vasc Surg.* 1984 Jan;1(1):36-44.
 - 15. Paraprosthetic-enteric fistula. O'Mara C, Imbembo AL *Surgery.* 1977 May;81(5):556-66.
 - 16. Incidence, clinical, microbiological features and outcome of bloodstream infections in patients undergoing hemodialysis. Fysarakis M, Samonis G, Valachis A, Daphnis E, Karageorgopoulos DE, Falagas ME, Stylianou K, Kofteridis DP *Int J Med Sci.* 2013;10(12):1632-8. Epub 2013 Sep 20.
 - 17. Arteriovenous Fistulae for Haemodialysis: A Systematic Review and Meta-analysis of Efficacy and Safety Outcomes. Bylsma LC, Gage SM, Reichert H, Dahl SLM, Lawson JH *Eur J Vasc Endovasc Surg.* 2017;54(4):513. Epub 2017 Aug 23.
 - 18. KDOQI Clinical Practice Guideline for Vascular Access: 2019 Update. Lok CE, Huber TS, Lee T, Shenoy S, Yevzlin AS, Abreo K, Allon M, Asif A, Astor BC, Glickman MH, Graham J, Moist LM, Rajan DK, Roberts C, Vachharajani TJ, Valentini RP, National Kidney Foundation *Am J Kidney Dis.* 2020;75(4 Suppl 2):S1. Epub 2020 Mar 12.
 - 19. Coronary steal from a left internal mammary artery coronary bypass graft by a left upper extremity arteriovenous hemodialysis fistula. Crowley SD, Butterly DW, Peter RH, Schwab SJ *Am J Kidney Dis.* 2002;40(4):852.
 - 20. Venous congestion of the breast mimicking inflammatory breast cancer: case report and review of literature. Blum C, Baker M *Breast J.* 2008 Jan-Feb;14(1):97-101.
 - 21. Angiosarcoma and Dialysis-related Arteriovenous Fistulae: A Comprehensive Review. Os-krochi Y, Razi K, Stebbing J, Crane J *Eur J Vasc Endovasc Surg.* 2016 Jan;51(1):127-33. Epub

- 2015 Oct 9.
22. Risk factors for duodenal stump leakage after gastrectomy for gastric cancer and management technique of stump leakage. Kim KH, Kim MC, Jung GJ *Hepatogastroenterology*. 2014 Jul-Aug;61(133):1446-53.
 23. Duodenal fistula after elective gastrectomy for malignant disease : an italian retrospective multicenter study. Cozzaglio L, Coladonato M, Biffi R, Coniglio A, Corso V, Dionigi P, Giannotti L, Mazzaferro V, Morgagni P, Rosa F, Rosati R, Roviello F, Doci R *J Gastrointest Surg*. 2010 May;14(5):805-11.
 24. Duodenal stump fistula after gastric surgery for malignancies: a retrospective analysis of risk factors in a single centre experience. Orsenigo E, Bissolati M, Socci C, Chiari D, Muffatti F, Nifosi J, Staudacher C *Gastric Cancer*. 2014 Oct;17(4):733-44.
 25. Management of gastogastric fistulas after divided Roux-en-Y gastric bypass surgery for morbid obesity: analysis of 1,292 consecutive patients and review of literature. Carrodeguas L, Szomstein S, Soto F, Whipple O, Simpfendorfer C, Gonzalvo JP, Villares A, Zundel N, Rosenthal R *Surg Obes Relat Dis*. 2005;1(5):467. Epub 2005 Aug 31.
 26. Postoperative pancreatic fistula: an international study group (ISGPF) definition. Bassi C, Dervenis C, Butturini G, Fingerhut A, Yeo C, Izicki J, Neoptolemos J, Sarr M, Traverso W, Buchler M, International Study Group on Pancreatic Fistula Definition *Surgery*. 2005;138(1):8.
 27. Bassi C, Marchegiani G, Dervenis C, Sarr M, Abu Hilal M, Adham M, Allen P, Andersson R, Asbun HJ, Besselink MG, Conlon K, Del Chiaro M, Falconi M, Fernandez-Cruz L, Fernandez-Del Castillo C, Fingerhut A, Friess H, Gouma DJ, Hackert T, Izicki J, Lillemoe KD, Neoptolemos JP, Olah A, Schulick R, Shrikhande SV, Takada T, Takaori K, Traverso W, Vollmer CR, Wolfgang CL, Yeo CJ, Salvia R, Buchler M; International Study Group on Pancreatic Surgery (ISGPS). The 2016 update of the International Study Group (ISGPS) definition and grading of postoperative pancreatic fistula: 11 Years After. *Surgery*. 2017 Mar;161(3):584-591. doi: 10.1016/j.surg.2016.11.014. Epub 2016 Dec 28. PMID: 28040257.
 28. Bassi C, Butturini G, Molinari E, Mascetta G, Salvia R, Falconi M, Gumbs A, Pederzoli P. Pancreatic fistula rate after pancreatic resection. The importance of definitions. *Dig Surg*. 2004;21(1):54-9. doi: 10.1159/000075943. Epub 2003 Dec 30. PMID: 14707394.
 29. Alexakis N, Sutton R, Neoptolemos JP. Surgical treatment of pancreatic fistula. *Dig Surg*. 2004;21(4):262-74. doi: 10.1159/000080199. Epub 2004 Aug 11. PMID: 15308865.
 30. Yeo CJ, Cameron JL, Lillemoe KD, Sauter PK, Coleman J, Sohn TA, Campbell KA, Choti MA. Does prophylactic octreotide decrease the rates of pancreatic fistula and other complications after pancreaticoduodenectomy? Results of a prospective randomized placebo-controlled trial. *Ann Surg*. 2000 Sep;232(3):419-29. doi: 10.1097/00000658-200009000-00014. PMID: 10973392; PMCID: PMC1421155.
 31. Muscari F, Suc B, Kirzin S, Hay JM, Fourtanier G, Fingerhut A, Sastre B, Chipponi J, Fagniez PL, Radovanovic A; French Associations for Surgical Research. Risk factors for mortality and intra-abdominal complications after pancreateoduodenectomy: multivariate analysis in 300 patients. *Surgery*. 2006 May;139(5):591-8. doi: 10.1016/j.surg.2005.08.012. PMID: 16701090.
 32. Ho HS, Frey CF. Gastrointestinal and pancreatic complications associated with severe pancreatitis. *Arch Surg*. 1995 Aug;130(8):817-22; discussion 822-3. doi: 10.1001/arch-surg.1995.01430080019002. PMID: 7632140.
 33. Fulcher AS, Capps GW, Turner MA. Thoracopancreatic fistula: clinical and imaging findings. *J Comput Assist Tomogr*. 1999 Mar-Apr;23(2):181-7. doi: 10.1097/00004728-199903000-00004. PMID: 10096323.
 34. Teixeira PG, Inaba K, Dubose J, Salim A, Brown C, Rhee P, Browder T, Demetriades D. Enterocutaneous fistula complicating trauma laparotomy: a major resource burden. *Am Surg*.

- 2009 Jan;75(1):30-2. doi: 10.1177/000313480907500106. PMID: 19213393.
35. Wercka J, Cagol PP, Melo AL, Locks Gde F, Franzon O, Kruel NF. Epidemiology and outcome of patients with postoperative abdominal fistula. *Rev Col Bras Cir.* 2016 Mar-Apr;43(2):117-23. English, Portuguese. doi: 10.1590/0100-69912016002008. PMID: 27275593.
36. Michelassi F, Stella M, Balestracci T, Giuliante F, Marogna P, Block GE. Incidence, diagnosis, and treatment of enteric and colorectal fistulae in patients with Crohn's disease. *Ann Surg.* 1993 Nov;218(5):660-6. doi: 10.1097/00000658-199321850-00012. PMID: 8239781; PMCID: PMC1243038.
37. Annibali R, Pietri P. Fistulous complications of Crohn's disease. *Int Surg.* 1992 Jan-Mar;77(1):19-27. PMID: 1577575.
38. Osborn C, Fischer JE. How I do it: gastrointestinal cutaneous fistulas. *J Gastrointest Surg.* 2009 Nov;13(11):2068-73. doi: 10.1007/s11605-009-0922-7. Epub 2009 Jun 9. PMID: 19506977.
39. Woods RJ, Lavery IC, Fazio VW, Jagelman DG, Weakley FL. Internal fistulas in diverticular disease. *Dis Colon Rectum.* 1988 Aug;31(8):591-6. doi: 10.1007/BF02556792. PMID: 3402284.
40. LaSpina M, Facklis K, Posalski I, Fleshner P. Coloseminal vesicle fistula: report of a case and review of the literature. *Dis Colon Rectum.* 2006 Nov;49(11):1791-3. doi: 10.1007/s10350-006-0717-9. PMID: 17024321.
41. Mileski WJ, Joehl RJ, Rege RV, Nahrwold DL. One-stage resection and anastomosis in the management of colovesical fistula. *Am J Surg.* 1987 Jan;153(1):75-9. doi: 10.1016/0002-9610(87)90204-2. PMID: 3799895.
42. Najjar SF, Jamal MK, Savas JF, Miller TA. The spectrum of colovesical fistula and diagnostic paradigm. *Am J Surg.* 2004 Nov;188(5):617-21. doi: 10.1016/j.amjsurg.2004.08.016. PMID: 15546583.
43. Melchior S, Cudovic D, Jones J, Thomas C, Gillitzer R, Thüroff J. Diagnosis and surgical management of colovesical fistulas due to sigmoid diverticulitis. *J Urol.* 2009 Sep;182(3):978-82. doi: 10.1016/j.juro.2009.05.022. Epub 2009 Jul 18. PMID: 19616793.
44. Bertelson NL, Abcarian H, Kalkbrenner KA, Blumetti J, Harrison JL, Chaudhry V, Young-Fadok TM. Diverticular colovesical fistula: What should we really be doing? *Tech Coloproctol.* 2018 Jan;22(1):31-36. doi: 10.1007/s10151-017-1733-6. Epub 2017 Dec 6. PMID: 29214364.
45. Jarrett TW, Vaughan ED Jr. Accuracy of computerized tomography in the diagnosis of colovesical fistula secondary to diverticular disease. *J Urol.* 1995 Jan;153(1):44-6. doi: 10.1097/00005392-199501000-00018. PMID: 7966788.
46. Miller RE. Role of hysterectomy in predisposing the patient to sigmoidovesical fistula complicating diverticulitis. *Am J Surg.* 1984 May;147(5):660-1. doi: 10.1016/0002-9610(84)90135-1. PMID: 6721044.
47. Hjern F, Goldberg SM, Johansson C, Parker SC, Mellgren A. Management of diverticular fistulae to the female genital tract. *Colorectal Dis.* 2007 Jun;9(5):438-42. doi: 10.1111/j.1463-1318.2006.01171.x. PMID: 17504341.
48. Berger MB, Khandwala N, Fenner DE, Burney RE. Colovaginal Fistulas: Presentation, Evaluation, and Management. *Female Pelvic Med Reconstr Surg.* 2016 Sep-Oct;22(5):355-8. doi: 10.1097/SPV.0000000000000289. PMID: 27171321; PMCID: PMC5002240.
49. Bahadursingh AM, Longo WE. Colovaginal fistulas. Etiology and management. *J Reprod Med.* 2003 Jul;48(7):489-95. PMID: 12953321.
50. Vasilevsky CA, Belliveau P, Trudel JL, Stein BL, Gordon PH. Fistulas complicating diverticulitis. *Int J Colorectal Dis.* 1998;13(2):57-60. doi: 10.1007/s003840050135. PMID: 9638488.

51. Hool GJ, Bokey EL, Pheils MT. Diverticular colo-enteric fistulae. *Aust N Z J Surg.* 1981 Aug;51(4):358-9. doi: 10.1111/j.1445-2197.1981.tb04965.x. PMID: 6944054.
52. Ahmad DS, Quist EE, Hutchins GF, Bhat I. Coloenteric fistula in a young patient with recurrent diverticulitis: A case report and review of the literature. *Neth J Med.* 2016 Oct;74(8):358-261. PMID: 27762218.
53. Garcea G, Majid I, Sutton CD, Pattenden CJ, Thomas WM. Diagnosis and management of colovesical fistulae; six-year experience of 90 consecutive cases. *Colorectal Dis.* 2006 May;8(4):347-52. doi: 10.1111/j.1463-1318.2005.00928.x. PMID: 16630242.
54. Golabek T, Szymanska A, Szopinski T, Bukowczan J, Furmanek M, Powroznik J, Chlostista P. Enterovesical fistulae: aetiology, imaging, and management. *Gastroenterol Res Pract.* 2013;2013:617967. doi: 10.1155/2013/617967. Epub 2013 Nov 21. PMID: 24348538; PMCID: PMC3857900.
55. Melchior S, Cudovic D, Jones J, Thomas C, Gillitzer R, Thüroff J. Diagnosis and surgical management of colovesical fistulas due to sigmoid diverticulitis. *J Urol.* 2009 Sep;182(3):978-82. doi: 10.1016/j.juro.2009.05.022. Epub 2009 Jul 18. PMID: 19616793.
56. Pollard SG. Colovesical fistula. *Ann R Coll Surg Engl.* 1988 May;70(3):184. PMID: 19311196; PMCID: PMC2498750.
57. Morrison PD, Addison NV. A study of colovesical fistulae in a district hospital. *Ann R Coll Surg Engl.* 1983 Jul;65(4):221-3. PMID: 6870126; PMCID: PMC2494347.
58. Najjar SF, Jamal MK, Savas JF, Miller TA. The spectrum of colovesical fistula and diagnostic paradigm. *Am J Surg.* 2004 Nov;188(5):617-21. doi: 10.1016/j.amjsurg.2004.08.016. PMID: 15546583.
59. Beatty JD, Witherow R. Diagnostic lessons learnt from a series of enterovesical fistulae. *Colorectal Dis.* 2005 Mar;7(2):196. doi: 10.1111/j.1463-1318.2005.00777.x. PMID: 15720363.
60. McCaffrey JC, Foo FJ, Dalal N, Siddiqui KH. Benign multicystic peritoneal mesothelioma associated with hydronephrosis and colovesical fistula formation: report of a case. *Tumori.* 2009 Nov-Dec;95(6):808-10. PMID: 20210248.
61. Moss RL, Ryan JA Jr. Management of enterovesical fistulas. *Am J Surg.* 1990 May;159(5):514-7. doi: 10.1016/s0002-9610(05)81259-0. PMID: 2334017.
62. Woods RJ, Lavery IC, Fazio VW, Jagelman DG, Weakley FL. Internal fistulas in diverticular disease. *Dis Colon Rectum.* 1988 Aug;31(8):591-6. doi: 10.1007/BF02556792. PMID: 3402284.
63. Solkar MH, Forshaw MJ, Sankararajah D, Stewart M, Parker MC. Colovesical fistula--is a surgical approach always justified? *Colorectal Dis.* 2005 Sep;7(5):467-71. doi: 10.1111/j.1463-1318.2005.00863.x. PMID: 16108883.
64. Daniels IR, Bekdash B, Scott HJ, Marks CG, Donaldson DR. Diagnostic lessons learnt from a series of enterovesical fistulae. *Colorectal Dis.* 2002 Nov;4(6):459-62. doi: 10.1046/j.1463-1318.2002.00370.x. PMID: 12790920.
65. El-Haddad HM, Kassem MI, Sabry AA, Abouelfotouh A. Surgical protocol and outcome for sigmoidovesical fistula secondary to diverticular disease of the left colon: A retrospective cohort study. *Int J Surg.* 2018 Aug;56:115-123. doi: 10.1016/j.ijsu.2018.05.742. Epub 2018 Jun 11. PMID: 29902524.
66. Andreani SM, Dang HH, Grondona P, Khan AZ, Edwards DP. Rectovaginal fistula in Crohn's disease. *Dis Colon Rectum.* 2007 Dec;50(12):2215-22. doi: 10.1007/s10350-007-9057-7. Epub 2007 Sep 11. PMID: 17846837.
67. Saclarides TJ. Rectovaginal fistula. *Surg Clin North Am.* 2002 Dec;82(6):1261-72. doi: 10.1016/s0039-6109(02)00055-5. PMID: 12516853.
68. Abcarian H. Anorectal infection: abscess-fistula. *Clin Colon Rectal Surg.* 2011 Mar;24(1):14-21. doi: 10.1055/s-0031-1272819. PMID: 22379401; PMCID: PMC3140329.



69. Gosselink MP, van Onkelen RS, Schouten WR. The cryptoglandular theory revisited. *Colorectal Dis.* 2015 Dec;17(12):1041-3. doi: 10.1111/codi.13161. PMID: 26547817.
70. Ramanujam PS, Prasad ML, Abcarian H, Tan AB. Perianal abscesses and fistulas. A study of 1023 patients. *Dis Colon Rectum.* 1984 Sep;27(9):593-7. doi: 10.1007/BF02553848. PMID: 6468199.
71. Hämäläinen KP, Sainio AP. Incidence of fistulas after drainage of acute anorectal abscesses. *Dis Colon Rectum.* 1998 Nov;41(11):1357-61; discussion 1361-2. doi: 10.1007/BF02237048. PMID: 9823799.
72. Hamadani A, Haigh PI, Liu IL, Abbas MA. Who is at risk for developing chronic anal fistula or recurrent anal sepsis after initial perianal abscess? *Dis Colon Rectum.* 2009 Feb;52(2):217-21. doi: 10.1007/DCR.0b013e31819a5c52. PMID: 19279415.
73. Sahnan K, Askari A, Adegbola SO, Tozer PJ, Phillips RKS, Hart A, Faiz OD. Natural history of anorectal sepsis. *Br J Surg.* 2017 Dec;104(13):1857-1865. doi: 10.1002/bjs.10614. Epub 2017 Aug 31. PMID: 28857130.
74. Sahnan K, Askari A, Adegbola SO, Warusavitarne J, Lung PFC, Hart A, Faiz O, Phillips RKS, Tozer P. Persistent Fistula After Anorectal Abscess Drainage: Local Experience of 11 Years. *Dis Colon Rectum.* 2019 Mar;62(3):327-332. doi: 10.1097/DCR.0000000000001271. PMID: 30451763.
75. Piazza DJ, Radhakrishnan J. Perianal abscess and fistula-in-ano in children. *Dis Colon Rectum.* 1990 Dec;33(12):1014-6. doi: 10.1007/BF02139215. PMID: 2242695.
76. Niyogi A, Agarwal T, Broadhurst J, Abel RM. Management of perianal abscess and fistula-in-ano in children. *Eur J Pediatr Surg.* 2010 Jan;20(1):35-9. doi: 10.1055/s-0029-1241878. Epub 2009 Nov 6. PMID: 19899037.
77. Nelson RL, Abcarian H, Davis FG, Persky V. Prevalence of benign anorectal disease in a randomly selected population. *Dis Colon Rectum.* 1995 Apr;38(4):341-4. doi: 10.1007/BF02054218. PMID: 7720437.
78. Vogel JD, Johnson EK, Morris AM, Paquette IM, Saclarides TJ, Feingold DL, Steele SR. Clinical Practice Guideline for the Management of Anorectal Abscess, Fistula-in-Ano, and Rectovaginal Fistula. *Dis Colon Rectum.* 2016 Dec;59(12):1117-1133. doi: 10.1097/DCR.000000000000733. PMID: 27824697.