

HEPATOBİLİYER CERRAHİDE ENDOSKOPIK (EUS& ERCP) YAKLAŞIMLAR

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GİRİŞ

Endoskopik ultrasonografi (EUS); Bir endoskopyun ucuna yüksek frekanslı ultrasonik transducerin eklenmesiyle oluşan endoskopi ve ultrasonun kombine edildiği bir cihazdır. İlk yıllarda daha çok özofagus ve mide patolojilerinin tanımlanmasında kullanılırken, EUS skoplarının geliştirilmesi, ilerleyen teknoloji ve deneyimin artması ile günümüzde pankreas-safra yolları lezyonlarının tanı ve tedavisinde daha sık kullanılmaya başlanmıştır. Hergün bir yenisi eklenen geliştirilmiş aksesuarlar ve aletlerle EUS klavuzluğunda girişimsel ve terapötik işlemler giderek artmaktadır.

Endoskopik retrograt kolanjiopankreatikografi (ERCP); safra yolları ve pankreas hastalıklarının tanı ve tedavisinde yaygın olarak kullanılan minimal invaziv bir işlemdir. ERCP başlarda hepatobiliyer hastalıkların tanısında önemli bir yeri varken, günümüzde terapötik amaçlı kullanımını daha yaygındır. Terapötik ERCP, gastroenterolojide teknik olarak en zorlu prosedürlerden biridir.

Biliyer Taşlarda Endoskopik Yaklaşım

Safra kesesi taşı olan hastaların yaklaşık %20'sinde koledokolitiazis bildirilmiştir (1). Genel olarak bu taşlar asemptomatik olsalar bile pankreatit ve kolanjit riski nedeni ile çıkarılmalıdır.

Koledokolitiazisi teşhis etmek her zaman kolay değildir. Eskiden ERCP, bu hastalarda müdahalede izin verdiği için öncelikle tercih edilirdi. Ancak ERCP'nin invaziv olması, radyasyon maruziyeti, pankreatit riski ve küçük taşları kaçırabilirliliği de göz önünde alındığında, koledokolitiazis şüphesi olan hastalarda ERCP öncesi EUS ile koledokolitiazisin doğrulanması istenir (2).

Koledokolitiazisi saptamada abdominal USG ile karşılaştırıldığında EUS'un en büyük avantajı; EUS ile duodenum ikinci kıtaya gidilerek, gaz ve abdominal yağdan etkilenmeden, tüm estrahepatik safra ağacının değerlendirilmesine izin vermesidir. Abdominal Ultrasonografi (USG) ve Bilgisayarlı Tomografi (BT) 'nin koledokolitiazisi gösterme başarısı benzerdir. Eğer dilate safra kanalı var ise duyarlılıkları %75 olup safra kanalı dilatasyonu yok ise %50'lere düşmektedir (3). Koledokolitiazis saptamada EUS ve Manyetik Rezonans Kolanjiografi (MRCP)'yi karşılaştıran bir çalışmada ortak safra kanalı taşlarının tanısında EUS, MRCP'ye göre biraz daha yüksek doğruluk (%93 karşın 90) göstermiştir (4).

Pratik açıdan EUS'un, özellikle ortak safra kanalının distalindeki mikrotaşları tespitindeki üstünlüğü ve MRCP'nin kontrendike olduğu (kalp pili olan hastalar gibi) hasta grupları için kullanılabilir olması EUS'un tercih sebebidir. Koledokolitiazis şüphesi olan hastalarda EUS ile kombine ERCP'yi safra kanalı taşlarının tespiti için sadece ERCP yapılması ile karşılaştıran bir çalışmada, ERCP öncesi EUS yapılması hastaların %67'sine gereksiz ERCP den kaçınılması-

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Pankreatik sıvının drenajına karar verilmeden önce MR-Kolanjiyografi veya ERCP ile kistik yapının pankreas kanalı ile ilişkisinin olup olmadığının araştırılması önemlidir. Pankreas kanal bütünlüğünün bozulması veya strüktür dreanaj işleminin başarısını azaltır. Bu nedenle bazı yayınlarda drenaj işleminden önce pankreatik kanala transpapiller stent yerleştirilmesi önerilmektedir (100).

Pankreas pseudokisti 6 haftadan daha uzun bir süre devam ederse ve ≥ 6 cm boyutunda ise, gastrik çıkış obstrüksiyonu veya safra tıkanıklığı gibi semptomlara veya komplikasyonlara neden oluyor ise drenaj önerilir (101).

WON steril ve asemptomatik olduğu sürece konservatif olarak tedavi edilir. Ateş, lökositoz, sepsis bulguları, mide ve duodenum çıkım obstrüksiyonu bulguları var ise ve WON boyutlarında progresif artış oluyor ise WON'un drenajı önerilir (102).

WOW ve Pseudokisti olan hastalarda transmural endoskopik drenajda kistin en çok bası yaptığı alandan veya lezyonun drenaj yapılacak mide veya duodenuma mesafesinin 1cm'den az olduğu yerden yapılması tercih edilir (103). İşlem skopi altında veya EUS eşliğinde yapılır. Skopi altında yapılan kistin endoskopik drenajında kistin en çok bası yaptığı alandan iğne uçlu sfinkterotomla kist boşluğuna bir fistül oluşturulur. Buradan klavuz tel ilerletilip takiben biliyer dilatasyon balonları ile oluşturulan fistül alanı genişletilir. Fistül alanına double pigtail plastik stentler yerleştirilir (103).

EUS eşliğinde işlem yapıldığında ise kistik lezyona 19Gauge iğne ile girilir ve içinden klavuz tel gönderilir takiben kistotomi veya biliyer dilatasyon bolunu ile dilate edilip plastik stentler, tam kaplı metalik stentler veya lümen oluşturan metalik stentler (LAMS) yerleştirilir. Lümen oluşturan metalik stentlerden endoskopik nekrozektomi işlemi de gerçekleştirilir (103).

KAYNAKLAR

1. Mitchell SE, Clark RA. A comparison of computed tomography and sonography in choledocholithiasis. *AJR Am J Roentgenol* 1984;142:729
2. Hareword GC, Wiersema MJ. Up to date (2019), Endoscopic ultrasound in patients with suspected choledocholithiasis.
3. Chak A, Hawes RH, Cooper GS. Prospective assessment of the utility of EUS in the evaluation of gallstone pancreatitis. *Gastrointest Endosc* 1999;49:599
4. De Castro VL, Moura EG, Chaves DM. Endoscopic ultrasound versus magnetic resonance cholangiopancreatography in suspected choledocholithiasis: A systematic review. *Endosc Ultrasound* 2016;5:118
5. Petrov MS, Savdes TJ. Systematic review of endoscopic ultrasonography versus endoscopic retrograde cholangiopancreatography for suspected choledocholithiasis. *Br J Surg* 2009;96:967
6. Corfield A, P Cooper MJ, Williamson RC. Prediction of severity in acute pancreatitis: prospective comparison of three prognostic indices. *Lancet* 1985;2:403.
7. Liu CL, Lo CM, Chan JK. EUS for detection of occult cholethiasis in patients with idiopathic pancreatitis. *Gastrointest Endosc* 2000;51:28.
8. Liu CL, Lo CM, Chan JK. Detection of choledocholithiasis by EUS in acute pancreatitis a prospective evaluation in 100 consecutive patients. *Gastrointest Endosc* 2001; 54:325.
9. Lauri A, Hortan RC, Davidson BR. Endoscopic extraction of bile duct Stones: management related to stone size. *Gut* 1993; 32:1718-1721.
10. Binmoeller KE, Katon RM, Shneidman R. Endoscopic management of postoperative biliary leaks: review of 77 cases and report of two cases with biloma formation. *Am J Gastroenterol* 1991;86:227-231.
11. Barkun AN, Rezieg M, Mehta SN, et al. Postcholecystectomy biliary leaks in the laparoscopic era: risk factors, presentation, and management. *McGill Gallstone Treatment Group. Gastrointest Endosc* 1997;45:277-282.
12. Agarwal N, Sharma BC, Garg S, Kumar R, Sarin SK. Endoscopic management of postoperative bile leaks. *Hepatobiliary Pancreat Dis Int* 2006;5:273-277.
13. Lam CM, Lo CM, Liu CL, Fan ST. Biliary complications during liver resection. *World J Surg* 2001;25:1273-1276.
14. Paquet JC, Dziri C, Hay JM, et al. Prevention of deep abdominal complications with omentoplasty on the raw surface after hepatic resection: the French Associations for Surgical Research. *Am J Surg* 2000;179:103-109.
15. Yun SU, Cheon YK, Shim CS. The outcome of endoscopic management of bile leakage after hepatobiliary surgery. *Korean J Intern Med* 2017 Jan; 32(1): 79-84.
16. Zyromski NJ, Lillemoe KD. Current Management of biliary leaks. *Advances in Surgery* 2006;40:21-46
17. Parlak E (2012). Kolesistektomiye bağlı Safra yolu yaralanmalarının Endoskopik Tanı ve Tedavisi. Dr Burhan şahin & Dr Erkan Parlak (Eds). *ERCP içinde* (s 225-245) Ankara: TGV yayınevi.

18. Dechene A, Jochum C, Fingas C, et al. Endoscopic management is the treatment of choice for bile leaks after liver resection. *Gastrointest Endosc*. 2014;80:626–633.
19. Kitami M, Murakami G, Suzuki D, et al. Heterogeneity of subvesical ducts or the ducts of Luschka: a study using infusion cholangiography-computed tomography in patients and cadaver specimens. *World J Surg* 2006;30:1316.
20. Ko K, Kamiya J, Nagino M, et al. A study of the subvesical bile duct (duct of Luschka) in resected liver specimens. *World J Surg* 2005;29:217.
21. Elboim CM, Goldman L, Hann L, et al. Significance of post-cholecystectomy subhepatic fluid collections. *Ann Surg* 1983; 198-137.
22. Sanders MK. Uptodate(2019). Endoscopic management of complications from laparoscopic cholecystectomy.
23. Strasberg SM, Herti M, Soper NJ. An analysis of the problem of biliary injury during laparoscopic cholecystectomy. *J Am Coll Surg* 1995;180:101-25.
24. Parlak E, Çiçek B, Dişibeyaz S, et al. Treatment of biliary leakages after cholecystectomy and importance of stricture development in the main bile duct injury. *Turk J Gastroenterol* 2005;16(1):21-28.
25. Kaffes AJ, Hourigan L, De LN. Impact of endoscopic intervention in 100 patients with suspected post-cholecystectomy bile leak. *Gastrointest Endosc* 2005 Feb;61(2):269-275.
26. Csézens A, Navarrete C, Burdiles P. Treatment of common bile duct injuries during laparoscopic cholecystectomy: endoscopic and surgical management. *World J Surg* 2001;25:1346-51.
27. Sandha GS, Bourke MJ, Haber GB, et al. Endoscopic therapy for bile leak based on new classification: result in 207 patients. *Gastrointest Endosc* 2004 Oct ; 60(4):567-574.
28. Marks JM, Ponsky JL, Shillingstad RB. Biliary stenting is more effective than sphincterotomy in the resolution of biliary leaks. *Surg Endosc* 1998;12:327–330.
29. Shah JN. Endoscopic treatment of bile leaks: current standards and recent innovations. *Gastrointest Endosc* 2007;65:1069-72.
30. Chow S, Bosco JJ, Heiss FW, et al. Successful treatment of post-cholecystectomy bile leaks using nasobiliary tube and sphincterotomy. *Am J Gastroenterol* 1997; 92:1839.
31. Bjorkman DJ, Carr-Locke DL, Lichtenstein DR, et al. Postsurgical bile leaks: endoscopic obliteration of the transpapillary pressure gradient is enough. *Am J Gastroenterol* 1995;90:2128–2133.
32. Bourke MJ, Elfant AB, Alhalel R, et al. Sphincterotomy-associated biliary strictures: features and endoscopic management. *Gastrointest Endosc* 2000;52:494.
33. Bergman JJ, Burgemeister L, Bruno MJ, et al. Long-term follow-up after biliary stent placement for postoperative bile duct stenosis. *Gastrointest Endosc* 2001; 54:154.
34. Costomagna G, Pandolfi M, Mutignani M, et al. Long term results of endoscopic management of postoperative bile duct strictures with increasing number of stents. *Gastrointest Endosc* 2001;54:162.
35. Wu J, Zhou DX. A New Fully Covered Self-Expandable Metal Stent for the Treatment of Postsurgical Benign Biliary Strictures. *Dig Dis Sci* 2017 Sep;62(9):2550-2557.
36. Glessing BR, Attam R, Amateau SK, et al. Novel use of long, large caliber, fenestrated stents for endoscopic transpapillary gallbladder stenting for therapy of symptomatic gallbladder disease. *Dig Dis Sci* 2015;60:3817-2.
37. Widmer J, Alvarez P, Sharaiha RZ, et al. Endoscopic gallbladder drainage for acute cholecystitis. *Clin Endosc* 2015;48:411-20.
38. Choi JH, Kim HW, Lee JC, et al. Percutaneous transhepatic versus EUS-guided gallbladder drainage for malignant cystic duct obstruction. *Gastrointest Endosc* 2017 Feb;85(2):357-364.
39. Boulay BR, Lo SK. Endoscopic Ultrasound-Guided Biliary Drainage. *Gastrointest Endosc Clin N Am*. 2018;28:171-85.
40. Mishra A, Tyberg A. Endoscopic ultrasound guided biliary drainage: a comprehensive review. *Transl Gastroenterol Hepatol* 2019; 4: 10.
41. Uemura RS, Khan MA, Otoch JP, et al. EUS-guided Choledochoduodenostomy Versus Hepaticogastrostomy: A Systematic Review and Meta-analysis. *J Clin Gastroenterol* 2018;52:123-30.
42. Bataille L, Deprez PA. A new application for therapeutic EUS: main pancreatic duct drainage with a “pancreatic rendezvous technique”. *Gastrointest Endosc*. 2002 May;55(6):740-3
43. Wang GJ, Gao CF, Wei D, Wang C, Ding SQ. Acute pancreatitis: etiology and common pathogenesis. *World J Gastroenterol*. 2009;15:1427–1430
44. Gullo L, Migliori M, Oláh A, Farkas G, Levy P, Arvanitakis C, Lankisch P, Beger H. Acute pancreatitis in five European countries: etiology and mortality. *Pancreas*. 2002;24:223–227.
45. Ahmed T, Chatila, Mohammad Bilal, and Praveen Gutturu. Evaluation and management of acute pancreatitis. *World J Clin Cases*. 2019 May 6; 7(9): 1006–1020.
46. Svatoň R, Kala Z, Novotný I. The timing of ERCP in acute biliary pancreatitis. *Rozhl Chir*. Winter 2019;98(1):10-13.
47. Forsmark CE, Baillie J; AGA Institute Clinical Practice and Economics Committee; AGA Institute Governing Board. AGA Institute technical review on acute pancreatitis. *Gastroenterology*. 2007;132:2022–2044.
48. Yıldırım B. Akut biliyer pankreatitte ERCP'nin yeri. Dr Burhan Şahin & Dr Erkan Parlak (Eds). *ERCP içinde* (s 333-336) Ankara: TGV yayınevi.
49. Coutinho LMA, Bernardo WM, Rocha RS. Early Endoscopic Retrograde Cholangiopancreatography Versus Conservative Treatment in Patients With Acute Biliary Pancreatitis: Systematic Review and Me-

- ta-analysis of Randomized Controlled Trials. *Pancreas*. 2018 Apr;47(4):444-453.
50. Yıldırım B. Rekürrent Akut Biliyer Pankreatit ve ERCP'nin Tanı ve Tedavideki yeri. Dr Burhan Şahin & Dr Erkan Parlak (Eds). *ERCP içinde* (s 337-343) Ankara: TGV yayınevi.
 51. Tandon M, Topazian M. Endoscopic ultrasound in idiopathic acute pancreatitis. *Am J Gastroenterol*. 2001;96:705-709.
 52. Venu RP, Geenen JE, Hogan W, Stone J, Johnson GK, Soregel K. Idiopathic recurrent pancreatitis. An approach to diagnosis and treatment. *Dig Dis Sci* 1989;34:56-60.
 53. Steinberg W, Tenner S. Acute pancreatitis. *N Engl J Med*. 1994;330:1198-1210.
 54. Lee SP, Nicholls JF, Park HZ. Biliary sludge as a cause of acute pancreatitis. *N Engl J Med* 1992;326:589-593.
 55. Wilcox CM, Seay T, Kim H. Prospective Endoscopic Ultrasound-Based Approach to the Evaluation of Idiopathic Pancreatitis: Causes, Response to Therapy, and Long-term Outcome. *Am J Gastroenterol*. 2016;111:1339-1348.
 56. Levy MJ, Geenen JE. Idiopathic acute recurrent pancreatitis. *Am J Gastroenterol* 2001;96:2540-2555.
 57. Gullo L, Migliori M, Pezzilli R. An update on recurrent acute pancreatitis: data from five European countries. *Am J Gastroenterol* 2002;97:1959-1962.
 58. Smith I, Ramesh J, Kyanam, et al Emerging Role of Endoscopic Ultrasound in the Diagnostic Evaluation of Idiopathic Pancreatitis. *Am J Med Sci* 2015; 350:229-234.
 59. Coyle WJ, Pineau BC, Tarnasky PR, et al. Evaluation of unexplained acute and acute recurrent pancreatitis using endoscopic retrograde cholangiopancreatography, sphincter of Oddi manometry and endoscopic ultrasound. *Endoscopy*. 2002;34:617-623.
 60. Cotton PB. Congenital anomaly of pancreas divisum as cause of obstructive pain and pancreatitis. *Gut*. 1980;21:105-114.
 61. Freeman ML, Nelson DB, Sherman S, et al. Complications of endoscopic biliary sphincterotomy. *N Engl J Med* 1996;335:909-918.
 62. Park SH, Watkins JL, Fogel EL, et al. Long-term outcome of endoscopic duodenal pancreatobiliary sphincterotomy in patients with manometry-documented sphincter of Oddi dysfunction and normal pancreatogram. *Gastrointest Endosc* 2003;57:483-491
 63. Eloubeidi MA, Gress FG, Savides TJ, et al. Acute pancreatitis after EUS-guided FNA of solid pancreatic masses: a pooled analysis from EUS centers in the United States. *Gastrointest Endosc* 2004;60:385-389.
 64. Coyle WJ, Pineau BC, Tarnasky PR, et al. Evaluation of unexplained acute and acute recurrent pancreatitis using endoscopic retrograde cholangiopancreatography, sphincter of Oddi manometry and endoscopic ultrasound. *Endoscopy* 2002;34:617-623.
 65. Rana SS, Bhasin DK, Sharma V, et al. Role of endoscopic ultrasound in the diagnosis of pancreas divisum. *Endosc Ultrasound* 2013;2:7-10.
 66. Jacob L, Greenen DJ, Catalana MF, et al. Prevention of pancreatitis in patients with idiopathic recurrent pancreatitis: a prospective non-blinded randomized study using endoscopic stent. *Endoscopy* 2001;33:559-562
 67. Ros E, Navarro S, Bru C, et al. Occult microlithiasis in 'idiopathic' acute pancreatitis: prevention of relapses by cholecystectomy or ursodeoxycholic acid therapy. *Gastroenterology* 1991;101:1701-1709.
 68. Pereira R, Eslick G, Cox M. Endoscopic Ultrasound for Routine Assessment in Idiopathic Acute Pancreatitis. *J Gastrointest Surg* 2019 Aug;23(8):1694-1700.
 69. Thevenot A, Bournet B, Otal P, et al. Endoscopic ultrasound and magnetic resonance cholangiopancreatography in patients with idiopathic acute pancreatitis. *Dig Dis Sci* 2013;58:2361-2368.
 70. Liu CL, Lo CM, Chan JK, et al. Detection of choledocholithiasis by EUS in acute pancreatitis: a prospective evaluation in 100 consecutive patients. *Gastrointest Endosc* 2001;54:325-330.
 71. Wan J, Ouyang Y, Yu C, et al. Comparison of EUS with MRCP in idiopathic acute pancreatitis: a systematic review and meta-analysis. *Gastrointest Endosc* 2018 May;87(5):1180-1188.
 72. Al-Haddad M, Wallace MB Diagnostic approach to patients with acute idiopathic and recurrent pancreatitis, what should be done? *World J Gastroenterol* 2008 Feb 21; 14(7): 1007-1010.
 73. DeWitt J, Devereaux B, Chriswell M, et al. Comparison of endoscopic ultrasonography and multidetector computed tomography for detecting and staging pancreatic cancer. *Ann Intern Med* 2004;141:753-763.
 74. Klapman JB, Chang KJ, Lee JG. Negative predictive value of endoscopic ultrasound in a large series of patients with a clinical suspicion of pancreatic cancer. *Am J Gastroenterol* 2005;100:2658-2661.
 75. Wilcox CM, Kilgore M. Cost minimization analysis comparing diagnostic strategies in unexplained pancreatitis. *Pancreas*. 2009;38:117-121.
 76. Kondo S, Isayama H, Akahane M, et al. Detection of common bile duct stones: comparison between endoscopic ultrasonography, magnetic resonance cholangiography, and helical-computed-tomographic cholangiography. *Eur J Radiol* 2005;54:271-275.
 77. Sharma M, Choudhary NS, Puri R. A child with unexplained etiology of acute pancreatitis diagnosed by endoscopic ultrasound. *Endosc Ultrasound* 2014;3:135-136
 78. Tenner S, Baillie J, DeWitt J. American College of Gastroenterology. American College of Gastroenterology guideline: management of acute pancreatitis. *Am J Gastroenterol* 2013;108:1400-1415; 1416.
 79. Working Group IAP/APA Acute Pancreatitis Guidelines. IAP/APA evidence-based guidelines for the management of acute pancreatitis. *Pancreatology* 2013;13:e1-15).
 80. Somani P, Sunkara T, M Role of endoscopic ultrasound in idiopathic pancreatitis *World J Gastroenterol* 2017 Oct 14; 23(38): 6952-6961.

81. Rana SS, Bhasin DK, Rao C. Role of endoscopic ultrasound in idiopathic acute pancreatitis with negative ultrasound, computed tomography, and magnetic resonance cholangiopancreatography. *Ann Gastroenterol* 2012;25:133–137.
82. Pham A, Forsmark C. Chronic pancreatitis: review and update of etiology, risk factors, and management. *Version 1. F1000Res*. 2018; 7: F1000 Faculty Rev-607.
83. Dumonceau JM, Delhaye M, Tringali A. Endoscopic treatment of chronic pancreatitis: European Society of Gastrointestinal Endoscopy (ESGE) Guideline. *Endoscopy* 2019; 51: 179–193.
84. Madzak A, Engjom T, Wathle GK. Secretin-stimulated MRI assessment of exocrine pancreatic function in patients with cystic fibrosis and healthy controls. *Abdom Radiol (NY)* 2017; 42(3): 890–9.
85. Tandan M, Nageshwar RD. Endotherapy in chronic pancreatitis. *World J Gastroenterol* 2013; 19: 6156–64.
86. Rosch T, Daniel S, Scholz M *et al*. Endoscopic treatment of chronic pancreatitis: a multicenter study of 1000 patients with long-term follow-up. *Endoscopy* 2002; 34: 765–71.
87. Khalid A, Whitcomb DC. Conservative treatment of chronic pancreatitis. *Eur J Gastroenterol Hepatol* 2002; 14: 943–9.
88. Parlak E (2012). Kronik pankreatitli Hastalarda Taş ve Darlıkların Endoskopik Tedavisi. Dr Burhan Şahin & Dr Erkan Parlak (Eds). *ERCP içinde* (s 344-359) Ankara: TGV yayınevi
89. Şişman G, Şentürk H. Kronik Pankreatitte Endoskopik Tedavi. *Türkiye Klinikleri J Gastroenterohepatol* 2012;19(2):75-83
90. Tringali A, Boskoski I. The role endoscopy in the therapy of chronic pancreatitis. *Best Pract Res Clin Gastroenterol* 2008; 22:154-165
91. Sherman S, Lehman GA. Endoscopic pancreatic sphincterotomy: techniques and complications. *Gastrointest Endosc Clin N Am* 1998;8(1):115-24.
92. Van Berkel AM, Cahen DL, van Westerloo DJ. Self-expanding metal stents in benign biliary strictures due to chronic pancreatitis. *Endoscopy* 2004;36(5):381-4.
93. Adler JM, Gardner TB. Endoscopic Therapies for Chronic Pancreatitis. *Dig Dis Sci* 2017 Jul;62(7):1729-1737.
94. Bezmarević M, Van Dijk SM, Voermans RP. Management of (Peri)Pancreatic Collections in Acute Pancreatitis. *Visc Med*. 2019 Apr;35(2):91-96
95. Banks PA, Bollen TL, Dervenis C, et al. Classification of acute pancreatitis 2012: revision of the Atlanta classification and definitions by international consensus. *Gut* 2013;62:102-11.
96. Lenhart DK, Balthazar EJ. MDCT of acute mild (nonnecrotizing) pancreatitis: abdominal complications and fate of fluid collections. *AJR Am J Roentgenol*. 2008;190:643–649.
97. Dhaka N, Samanta J, Kochhar S. Pancreatic fluid collections: What is the ideal imaging technique? *World J Gastroenterol*. 2015 Dec 28; 21(48): 13403–13410.
98. Working Party of the British Society of Gastroenterology; UK guidelines for the management of acute pancreatitis. *Gut*. 2005;54 (Suppl 3):iii1–iii9.
99. Singh VK, Bollen TL, Wu BU et al. An assessment of the severity of interstitial pancreatitis. *Clin Gastroenterol Hepatol* 2011;9:1098–1103.
100. Trevino JM, Tamhane A, Varadarajulu S. Successful stenting in ductal disruption favorably impacts treatment outcomes in patients undergoing transmural drainage of peripancreatic fluid collections. *J Gastroenterol Hepatol* 2010;25:526-31.
101. Bradley EL, Clements JL, Jr, Gonzalez AC. The natural history of pancreatic pseudocysts: a unified concept of management. *Am J Surg*. 1979;137:135–141. doi: 10.1016/0002-9610(79)90024-2.
102. Dalsania R, Willingham FF. Treatment of walled-off pancreatic necrosis. *Curr Opin Gastroenterol*. 2019 Jul 15. doi: 10.1097/MOG.0000000000000564.
103. Shahid H. Endoscopic management of pancreatic fluid collections. *Transl Gastroenterol Hepatol* 2019;4:15.