

# Behandlung von Infektionen der Gallenblase und der Gallenwege

Die Expertenkommission der InfektLiga: Dieter Adam, Klaus-F. Bodmann, Wolfgang Elies, Cordula Lebert, Kurt Naber, Fritz Sörgel, Arne Rodloff, Friedrich Vogel, Hannes Wacha

Koordination: Friedrich Vogel, Hannes Wacha

Manuskript: Cordula Lebert

- Alveyn CG, Robertson DA, Wright R. Piperacillin to prevent cholangitis after endoscopic retrograde cholangiopancreatography. *Ann Intern Med* 1996;125:442–7.
- Alvarez OA, Vanegas F, Maze GL, et al. Polymicrobial cholangitis and liver abscess in a patient with the acquired immunodeficiency syndrome. *South Med J* 2000;93:232–4.
- American College of Obstetricians and Gynecologists Women's Health Care Physicians. Cholecystitis, biliary tract surgery, and pancreatitis. *Obstet Gynecol* 2004;104(Suppl 4):17S–24S.
- Ammori BJ, Davides D, Vezakis A, Larvin M, et al. Laparoscopic cholecystectomy: are patients with biliary pancreatitis at increased operative risk? *Surg Endosc* 2003;17:777–80.
- Antrum RM, Bibby SR, Ramsden CH, Kester RC. Teicoplanin: Part 2. Evaluation of its use in the biliary system. *Drugs Exp Clin Res* 1989;15:25–7.
- Asoglu O, Ozmen V, Karanlik H, Igcı A, et al. Does the complication rate increase in laparoscopic cholecystectomy for acute cholecystitis? *J Laparoendosc Adv Surg Tech A* 2004;14:81–6.
- Attili AF, De Santis A, Capri R, Repice AM, et al. The natural history of gallstones: the GREPCO experience. The GREPCO Group. *Hepatology* 1995;21:655–60.
- Barkholt LM, Andersson J, Ericzon B-G, Palmgren A-C, et al. Stool cultures obtained before liver transplantation are useful for choice of perioperative antibiotic: Prophylaxis. *Transpl Int* 1997;10:432–8.
- Barone JE, Bears S, Chen S, Tsai J, et al. Outcome study of cholecystectomy during pregnancy. *Am J Surg* 1999;177:232–6.
- Barzilay M. Sonographic demonstration of pseudo-cholelithiasis after ceftriaxone. *Harefuah* 1994;127:163–5, 215.
- Bergman JJ, Rauws EA, Tijssen JG, Tytgat GN, et al. Biliary endoprotheses in elderly patients with endoscopic irretrievable common bile duct stones: report on 117 patients. *Gastrointest Endosc* 1995;42:195–201.
- Bhattacharya D, Senapati PS, Hurler R, Ammori BJ. Urgent versus interval laparoscopic cholecystectomy for acute cholecystitis: a comparative study. *J Hepatobiliary Pancreat Surg* 2002;9:538–42.
- Bornman PC, van Beljon JJ, Krige JEJ. Management of cholangitis. *J Hepatobiliary Pancreat Surg* 2003;10:406–14.
- Branicki FJ. Abdominal emergencies: Diagnostic and therapeutic laparoscopy. *Surg Infect* 2002;3:269–82.
- Brogard JM, Jehl F, Blicke JF, Monteil H, et al. Experimental and clinical evaluation of the biliary elimination of ceftazidime. *Pathol Biol (Paris)* 1986;34:332–8.
- Brown RB, Martyak SN, Barza M, Curtis L, et al. Penetration of clindamycin phosphate into the abnormal human biliary tract. *Ann Intern Med* 1976;84:168–70.
- Byl B, Devière J, Struelens MJ, et al. Antibiotic prophylaxis of infectious complications after therapeutic endoscopic retrograde cholangiopancreatography: a randomized, double-blind placebo-controlled study. *Clin Infect Dis* 1995;20:1236–40.
- Chacon JP, Criscuolo PD, Kobata CM, Ferraro JR, et al. Prospective randomized comparison of pefloxacin and ampicillin plus gentamicin in the treatment of bacteriologically proven biliary tract infections. *J Antimicrob Chemother* 1990;26(Suppl B):167–72.
- Chahin F, Dwivedi A, Chahin C, Agrawal S, et al. The laparoscopic challenge of cholecystitis. *J Soc Laparoendosc Surg* 2002;6:155–8.
- Cheung K-L, Lai ECS. Endoscopic stenting for malignant biliary obstruction. *Arch Surg* 1995;130:204–7.
- Chin A, Okamoto MP, Gill MA, Sclar DA, et al. Intraoperative concentrations of ofloxacin in serum, bile fluid, and gallbladder wall tissue. *Antimicrob Agents Chemother* 1990;34:2354–7.
- Chopra KB, Peters RA, PA OT, et al. Randomised study of endoscopic biliary endoprothesis versus duct clearance for bile duct stones in high-risk patients. *Lancet* 1996;348:791–3.
- Claesson B, Holmlund D, Matzsch T. Biliary microflora in acute cholecystitis and the clinical implications. *Acta Chir Scand* 1984;150:229–37.
- Clark NM, Chenoweth CE. *Aeromonas* infection of the hepatobiliary system: report of 15 cases and review of the literature. *Clin Infect Dis* 2003;37:506–13.
- Condon RE, Walker AP, Hanna CB, Greenberg RN, et al. Penetration of meropenem in plasma and abdominal tissues from patients undergoing intraabdominal surgery. *Clin Infect Dis* 1997;24(Suppl 2):181–3.
- Cotton PB. Stents for stones: short-term good, long-term uncertain. *Gastrointest Endosc* 1995;42:272–3.
- Dalton HR, Chapman RW. Role of biliary stenting in the management of bile duct stones in the elderly. *Gut* 1995;36:485–7.
- Davidson BR, Neoptolemos JP, Carr-Locke DL. Endoscopic sphincterotomy for common bile duct calculi in patients with gall bladder in situ considered unfit for surgery. *Gut* 1988;29:114–20.
- Davis AJM, Kolios G, Alveyn CG, Robertson DAF. Antibiotic prophylaxis for ERCP: a comparison of oral ciprofloxacin with intravenous cephazolin in the prophylaxis of high-risk patients. *Aliment Pharmacol Ther* 1998;12:207–11.
- Dobay KJ, Freier DT, Albear P. The absent role of prophylactic antibiotics in low-risk patients undergoing laparoscopic cholecystectomy. *Am Surg* 1999;65:226–8.
- Dougherty SH, Sirinek KR, Schauer PR, Ik MP, et al. Ticarcillin/clavulanate compared with clindamycin/gentamicin (with or without ampicillin) for the treatment of intra-abdominal infections in pediatric and adult patients. *Am Surg* 1995;61:297–303.
- Elsakr R, Johnson DA, Younes Z, Oldfield EC 3rd. Antimicrobial treatment of intra-abdominal infections. *Dig Dis* 1984;16:47–60.

*InfektLiga e. V., Prof. Dr. med. Friedrich Vogel (Vorsitzender), c/o Kliniken des Main-Taunus-Kreises, Lindenstraße 10, 65719 Hofheim im Taunus, E-Mail: fvogel@kliniken-mtk.de*

33. Escourrou J, Cordova JA, Lazorhtes F, Frexinós J, et al. Early and late complications after endoscopic sphincterotomy for biliary lithiasis with and without the gall bladder "in situ". *Gut* 1984; 25:598–602.
34. Fachgruppe Chirurgie beim Bundeskuratorium Qualitätssicherung. Externe vergleichende Qualitätssicherung in der Cholezystektomie. *Chirurg BDC* 2003;3:M68–73.
35. Festi D, Scottili S, Colecchia A, et al. Clinical manifestations of gallstone disease: evidence from the multicenter Italian study on cholelithiasis (MICOL). *Hepatology* 1999;30:839–46.
36. Gascon AR, Campo E, Olea E, Hernandez RM, et al. Pharmacokinetics and tissue distribution of intravenous pefloxacin for antibiotic prophylaxis in biliary surgery. *Biopharm Drug Dispos* 2002;23:293–300.
37. Gatsoulis N, Koulas S, Kiparos G, Tzafestas N, et al. Laparoscopic cholecystectomy in obese and nonobese patients. *Obes Surg* 1999;9:459–61.
38. Giron JA, Meyers BR, Hirschman SZ. Biliary concentrations of piperacillin in patients undergoing cholecystectomy. *Antimicrob Agents Chemother* 1981;19:309–11.
39. Glambek I, Arnesjo B, Soreide O. Correlation between gallstones and abdominal symptoms in a random population. Results from a screening study. *Scand J Gastroenterol* 1989;24: 277–81.
40. Goldstein EJC, Snyderman DR. Intraabdominal infections: review of the bacteriology, antimicrobial susceptibility and the role of ertapenem in their therapy. *J Antimicrob Chemother* 2004;53(Suppl):29–36.
41. Gottschalk U, Boden G, Rockstroh T, Mehl M. Mikrobiologisches Monitoring von Patienten mit Gallengangstents. *Chemother J* 2000;4:148–52.
42. Hammarstrom LE, Holmin T, Stridbeck H. Endoscopic treatment of bile duct calculi in patients with gallbladder in situ: long-term outcome and factors. *Scand J Gastroenterol* 1996;31:294–301.
43. Hamy A, Visset J, Likholatnikov D, et al. Percutaneous cholecystostomy for acute cholecystitis in critically ill patients. *Surgery* 1997;121:398–401.
44. Hanau LH, Steigbigel NH. Acute (ascending) cholangitis. *Infect Dis Clin North Am* 2000;14:521–46.
45. Harling R, Moorjani N, Perry C, MacGowan AP, et al. A prospective, randomised trial of prophylactic antibiotics versus bag extraction in the prophylaxis of wound infection in laparoscopic cholecystectomy. *Ann R Coll Surg Engl* 2000;82:408–10.
46. Harris A, Chan ACH, Torres-Viera C, Hammett R, et al. Meta-analysis of antibiotic prophylaxis in endoscopic retrograde cholangiopancreatography (ERCP). *Endoscopy* 1999;31:718–24.
47. Having K, Ryter S. Biliary pseudolithiasis: a reversible condition. *J Diagn Med Sonography* 2003;19:360–4.
48. Higgins A, London J, Charland S, Ratzler E, et al. Prophylactic antibiotics for elective laparoscopic cholecystectomy: are they necessary? *Arch Surg* 1999;134:611–3; discussion 614.
49. Holman JM, Rikkers LF. Biliary obstruction and host defense failure. *J Surg Res* 1982;32: 208–13.
50. Illig KA, Schmidt E, Cavanaugh J, Krusch D, et al. Are prophylactic antibiotics required for elective laparoscopic cholecystectomy? *J Am Coll Surg* 1997;184:353–6.
51. Jiang WG, Puntis MC. Immune dysfunction in patients with obstructive jaundice, mediators and implications for treatments. *HPB Surg* 1997;10:129–42.
52. Johansson M, Thune A, Nelvin L, Stiernstam M, et al. Randomized clinical trial of open versus laparoscopic cholecystectomy in the treatment of acute cholecystitis. *Br J Surg* 2005;92:44–9.
53. Johnson GK, Geenen JE, Venu RP, Schmalz MJ, et al. Treatment of non-extractable common bile duct stones with combination ursodeoxycholic acid plus endoprotheses. *Gastrointest Endosc* 1993;39:528–31.
54. Jorgensen T. Abdominal symptoms and gallstone disease: an epidemiological investigation. *Hepatology* 1989;9:856–60.
55. Kanellakopoulou K, Giamarellou H, Papadomakos P, Tspiras H, et al. Meropenem versus imipenem/cilastatin in the treatment of intraabdominal infections requiring surgery. *Eur J Clin Microbiol Infect Dis* 1993;12: 449–53.
56. Kasai Y, Nakanishi M, Sawada Y, Nakamura T, et al. Studies on cefotaxime (HR 756) concentration in human biliary tract and clinical effect for acute or subacute cholecystitis with cholelithiasis (author's transl.). *Jpn J Antibiot* 1981;34:447–52.
57. Keulemans YC, Rauws EA, Huibregtse K, Gouma DJ. Current management of gallbladder after endoscopic sphincterotomy for common bile duct stones. *Gastrointest Endosc* 1997;46:514–9.
58. Kiesslich R, Holfelder M, Will D, Hahn M, et al. Interventional ERCP in patients with cholestasis. Degree of biliary bacterial colonization and antibiotic resistance. *Z Gastroenterol* 2001;39:985–92.
59. Kiesslich R, Will D, Hahn M, Nafe B, et al. Ceftriaxone versus levofloxacin for antibiotic therapy in patients with acute cholangitis. *Z Gastroenterol* 2003;41:5–10.
60. Kiss JJ, Farago E, Kiss B, Varhelyi I. Pharmacokinetic study of rifampicin in biliary surgery. *Intern J Clin Pharmacol Biopharm* 1978;16:105–9.
61. Kiviluoto T, Siren J, Luukkonen P, Kivilaakso E. Randomised trial of laparoscopic versus open cholecystectomy for acute gangrenous cholecystitis. *Lancet* 1998;351:321–5.
62. Kraas E, Frauenschuh D. Cholezysto-/Choledocholithiasis. 10 Jahre laparoskopische Cholezystektomie am Krankenhaus Moabit, Berlin. *Viszeralchirurgie* 2000;35:321–5.
63. Lai EC, Moc FP, Tan ES, et al. Endoscopic biliary drainage for severe acute cholangitis. *N Engl J Med* 1992;326:1582–6.
64. Lau JY, Chung SC, Leung JW, Ling TK, et al. Endoscopic drainage aborts endotoxaemia in acute cholangitis. *Br J Surg* 1996;83:181–4.
65. Lewis RT, Goodall RG, Marien B, Park M, et al. Biliary bacteria, antibiotic use, and wound infection in surgery of the gallbladder and common bile duct. *Arch Surg* 1987;122:44–7.
66. Lorenz R, Herrmann M, Kassem AM, Lehn N, et al. Microbiological examinations and in vitro testing of different antibiotics in therapeutic endoscopy of the biliary system. *Endoscopy* 1998;30:708–12.
67. Lorenz R, Lehn N, Born P, Herrmann M, et al. Antibiotische Prophylaxe mit Cefuroxim bei endoskopischen Eingriffen an den Gallenwegen. *Dtsch Med Wochenschr* 1996;121: 223–30.
68. Lubasch A, Lode H. Antibiotische Therapie bei Cholezystitis, Cholangitis und Pankreatitis. *Internist* 2000;41:168–74.
69. Lu EJ, Curet MJ, El-Sayed YY, Kirkwood KS. Medical versus surgical management of biliary tract disease in pregnancy. *Am J Surg* 2004;188:755–9.
70. Madan AK, Aliabadi-Wahle S, Tesi D, Flint LM, et al. How early is early laparoscopic treatment of acute cholecystitis? *Am J Surg* 2002;183:232–6.
71. Madhavan T, Block M, Quinn EL, Cox F, et al. Comparative biliary concentrations of cephalozolin and cephalothin in patients with biliary tract disease. *Scott Med J* 1976;20:255–8.
72. Mahatharadol V. A reevaluation of antibiotic prophylaxis in laparoscopic cholecystectomy: a randomized controlled trial. *J Med Assoc Thai* 2001;84:105–8.
73. Maxton DG, Tweedle DE, Martin DF. Retained common bile duct stones after endoscopic sphincterotomy: temporary and longterm treatment with biliary stenting. *Gut* 1995;36: 446–9.
74. Mehal WZ, Culshaw KD, Tillotson GS, Chapman RW. Antibiotic prophylaxis for ERCP: A randomized clinical trial comparing ciprofloxacin and cefuroxime in 200 patients at high risk of cholangitis. *Eur J Gastroenterol Hepatol* 1995;7:841–5.
75. Mencacci A, Cenci E, Mazzolla R, Farinelli S, et al. *Aeromonas veronii* biovar *veronii* septicaemia and acute suppurative cholangitis in a patient with hepatitis B. *J Med Microbiol* 2003;52:727–30.
76. Miller BM, Kozarek RA, Ryan JA Jr., Ball TJ, et al. Surgical versus endoscopic management of common bile duct stones. *Ann Surg* 1998;207:135–41.
77. Moorthi K, Fleckenstein G, Nies B. Concentration of cefixime in bile, gallbladder wall and serum after preoperative administration in patients undergoing cholecystectomy. *Methods Find Exp Clin Pharmacol* 1990;12: 287–90.
78. Napolitano L, Waku M, Di Bartolomeo N, Aceto L, et al. Clinical study on laparoscopic approach to cholelithiasis in the elderly. *G Chir* 2004;25:301–3.
79. Neoptolemos JP, Carr-Locke DL, Fraser I, Fossard DP. The management of common bile duct calculi by endoscopic sphincterotomy in patients with gallbladders in situ. *Br J Surg* 1984;71:69–71.
80. Neve R, Biswas S, Dhir V, Mohandas KM, et al. Bile cultures and sensitivity patterns in malignant obstructive jaundice. *Indian J Gastroenterol* 2003;22:16–8.

81. Newell KA, Millis JM, Arnow PM, Bruce DS, et al. Incidence and outcome of infection by vancomycin-resistant *Enterococcus* following orthotopic liver transplantation. *Transplantation* 1998;65:439–42.
82. Niederau C, Pohlmann U, Lubke H, Thomas L. Prophylactic antibiotic treatment in therapeutic or complicated diagnostic ERCP: Results of a randomized controlled clinical study. *Gastrointest Endosc* 1994;40:533–7.
83. Orozco H, Sifuentes-Osornio J, Chan C, Medina-Franco H, et al. Comparison of ceftriaxone vs. amoxicillin/clavulanic acid as antibiotic prophylaxis in cholecystectomy and/or biliary tract surgery. *J Gastrointest Surg* 2000;4:606–10.
84. Pena C, Gudiol F. Cholecystitis and cholangitis: Spectrum of bacteria and role of antibiotics. *Dig Surg* 1996;13:317–20.
85. Pereira-Limaa JC, Jakobs R, Winter UH, et al. Long-term results (7 to 10 years) of endoscopic papillotomy for choledocholithiasis. Multivariate analysis of prognostic factors for the recurrence of biliary symptoms. *Gastrointest Endosc* 1998;48:457–64.
86. Pessaux P, Regenet N, Tuech JJ, Rouge C, et al. Laparoscopic versus open cholecystectomy: a prospective comparative study in the elderly with acute cholecystitis. *Surg Laparosc Endosc Percutan Tech* 2001;11:252–5.
87. Peters R, Macmathuna P, Lombard M, Karani J, et al. Management of common bile duct stones with a biliary endoprosthesis. Report on 40 cases. *Gut* 1992;33:1412–5.
88. Ram MD, Watanatittan S. Biliary excretion and concentration of cefazolin. *Am J Gastroenterol* 1976;66:540–5.
89. Ransohoff DF, Gracie WA. Treatment of gallstones. *Ann Intern Med* 1993;119:606–19.
90. Rerknimitr R, Fogel EL, Kalayci C, Esber E, et al. Microbiology of bile in patients with cholangitis or cholestasis with and without plastic biliary endoprosthesis. *Gastrointest Endosc* 2002;56:885–9.
91. Rolain JM, Lepidi H, Harle JR, Allegre T, et al. Acute acalculous cholecystitis associated with Q fever: report of seven cases and review of the literature. *Eur J Clin Microbiol Infect Dis* 2003;22:222–7.
92. Sabiston textbook of surgery: The biological basis of modern surgical practice. 17th edition. New York: Elsevier Saunders, 2004.
93. Sabiston DC, Keulemans YC, Rauws EA, Huibregtse K, et al. Current management of gallbladder after endoscopic sphincterotomy for common bile duct stones. *Gastrointest Endosc* 1997;46:514–9.
94. Salim AS. Percutaneous aspiration, lavage and antibiotic instillation. New approach in the management of acute cholecystitis failing to respond to conservative management. *HBP Surg* 1992;5:271–3.
95. Schoengut H, Jelinek R. Comparative study of the effects of ceftazidime compared with tobramycin plus cefamandole in the treatment of gall bladder empyema. *J Antimicrob Chemother* 1983;12(Suppl A):219–22.
96. Serralta AS, Bueno JL, Planells MR, Rodero DR. Prospective evaluation of emergency versus delayed laparoscopic cholecystectomy for early cholecystitis. *Surg Laparosc Endosc Percutan Tech* 2003;13:71–5.
97. Sheen-Chen S, Chen W, Eng H, Sheen C, et al. Bacteriology and antimicrobial choice in hepatolithiasis. *Am J Infect Control* 2000;28:298–301.
98. Sherman S, Hawes RH, Lehman GA. Management of bile duct stones. *Semin Liver Dis* 1990;10:205–21.
99. Smith BC, Algamish JR, Watson KJ, Shaw RG, et al. Preventing endoscopic retrograde cholangiopancreatography related sepsis: a randomized controlled trial comparing two antibiotic regimens. *J Gastroenterol Hepatol* 1996;11:938–41.
100. Solomkin J, Templer H, Graham D, Gesser R, et al. Treatment of polymicrobial infections: post hoc analysis of three trials comparing ertapenem and piperacillin/tazobactam. *J Antimicrob Chemother* 2004;53(Suppl):51–7.
101. Sondena K, Nesvik I, Solhaug JH, Soreide O. Randomization to surgery or observation in patients with symptomatic gallbladder stone disease. The problem of evidence-based medicine in clinical practice. *Scand J Gastroenterol* 1997;32:611–6.
102. Soomers AJ, Nagengast FM, Yap SH. Endoscopic placement of biliary endoprosthesis in patients with endoscopically unextractable common bile duct stones. A long-term follow up study of 26 patients. *Endoscopy* 1990;22:24–6.
103. Spicak J, Stirand P, Zavoral M, Keil R, et al. Antibiotic prophylaxis of cholangitis complicating endoscopic treatment of biliary obstruction. *Ceska Slov Gastroenterol Hepatol* 2001;55:211–5.
104. Staub-Schmidt T, Hansmann Y, Mutter D, Coumaros D, et al. Pseudo-lithiasis of the gallbladder in a patient on ceftriaxone. Based upon a new case. *J Med (Strasbourg)* 1994;25:275–7.
105. Sugiyama M, Atomi Y. Follow-up of more than 10 years after endoscopic sphincterotomy for choledocholithiasis in young patients. *Br J Surg* 1998;85:917–21.
106. Sung JY, Costerton JW, Shaffer EA. Defense system in the biliary tract against bacterial infection. *Dig Dis Sci* 1992;37:689–96.
107. Sung JY, Lyon DJ, Suen R, Sydney Chung SC, et al. Intravenous ciprofloxacin as treatment for patients with acute suppurative cholangitis: a randomized, controlled clinical trial. *J Antimicrob Chemother* 1995;35:855–64.
108. Swoboda S, Oberdorfer K, Klee F, Hoppe-Tichy T, et al. Tissue and serum concentrations of levofloxacin 500 mg administered intravenously or orally for antibiotic prophylaxis in biliary surgery. *J Antimicrob Chemother* 2003;51:459–62.
109. Tambyraja AL, Kumar S, Nixon SJ. Outcome of laparoscopic cholecystectomy in patients 80 years and older. *World J Surg* 2004;28:745–8.
110. Targarona EM, Ayuso RM, Bordas JM, et al. Randomised trial of endoscopic sphincterotomy with gallbladder left in situ versus open surgery for common bile duct calculi in high-risk patients. *Lancet* 1996;347:929–9.
111. Thompson JE Jr., Bennion RS, Doty JE, Muller EL, et al. Predictive factors for bacteraemia in acute cholecystitis. *Arch Surg* 1990;125:261–4.
112. Thompson Jr. JE, Bennion RS, Roettger R, Lally KP, et al. Cefepime for infections of the biliary tract. *Surg Gynecol Obstet* 1993;177(Suppl):30–4.
113. Thompson Jr. JE, Pitt HA, Doty JE, Coleman J, et al. Broad spectrum penicillin as an adequate therapy for acute cholangitis. *Surg Gynecol Obstet* 1990;171:275–82.
114. Tocchi A, Lepre L, Costa G, Liotta G, et al. The need for antibiotic prophylaxis in elective laparoscopic cholecystectomy: a prospective randomized study. *Ann Surg* 2000;135:67–70; discussion 70.
115. Torgerson JS, Lindroos AK, Naslund I, Peltonen M. Gallstones, gallbladder disease, and pancreatitis: cross-sectional and 2-year data from the Swedish Obese Subjects (SOS) and SOS reference studies. *Am J Gastroenterol* 2003;98:1032–41.
116. Trauner M, Fickert P, Schreiber F. Acute severe cholangitis. *Intensivmedizin und Notfallmedizin* 2003;40:285–93.
117. Uetera Y, Yokota T, Hiramatsu K, Sato K, et al. Role of bacterial biofilms in the chemotherapy of cholangitis with brown pigment stones. *Chemotherapy* 1996;42:363–73.
118. Van De Meeberg PC, Van Berge Henegouwen GP. No routine antibiotic prophylaxis necessary with endoscopic retrograde cholangiopancreatography. *Ned Tijdschr Geneesk* 1997;141:412–3.
119. Van den Hazel SJ, Speelman P, Dankert J, Huibregtse K, et al. Piperacillin to prevent cholangitis after endoscopic retrograde cholangiopancreatography. A randomized controlled trial. *Ann Intern Med* 1996;125:442–7.
120. Verardi S, Verardi V. Bile rifaximin concentration after oral administration in patients undergoing cholecystectomy. *Farmaco* 1990;45:131–5.
121. Vuilleumier H, Nermin H. Laparoscopic cholecystectomy as a day surgery procedure: implementation and audit of 136 consecutive cases in a university hospital. *World J Surg* 2004;28:737–40.
122. Wacha H. Steinerkrankungen der Gallenwege – ein Problem alter Menschen? *Z Gerontol* 1992, 25:313–8.
123. Wacha H, Ungeheuer E. Der „sogenannte symptomlose“ Gallenstein. *Dtsch Ärzteztbl* 1988;85:1809–18.
124. Wacha H. Die Bedeutung der Chemotherapie bei chirurgischen Gallenwegserkrankungen. Eine mikrobielle und experimentelle Studie. Habilitationsschrift für das Fach Chirurgie, Frankfurt am Main, 1978.
125. Wacha H, Knothe H. Antibiotic concentrations of the gallbladder following cystic duct stenosis. Clinical studies and animal experiments. *Chirurgisches Forum für Experimentelle und Klinische Forschung* 1978;177–81.
127. Wacha H. Risikoadaptierte Antibiotikaprophylaxe in der Chirurgie, chirurgische und endoskopische Eingriffe. *Kliniker* 2002;3:299–303.

128. Wenckert A, Robertson B. The natural course of gallstone disease: eleven-year review of 781 non-operated cases. *Gastroenterology* 1966;50:376–81.
129. Westphal JF, Brogard JM. Biliary tract infections: a guide to drug treatment. *Drugs* 1999;57:81–91.
130. Wetter LA, Hamadeh RM, Griffiss JMCL, Oesterle A, et al. Differences in outer membrane characteristics between gallstone-associated bacteria and normal bacterial flora. *Lancet* 1994;343:444–8.
131. Wilson SE, Nord CE. Clinical trials of extended spectrum penicillin/beta-lactamase inhibitors in the treatment of intra-abdominal infections: European and North American experience. *Am J Surg* 1995;169:215–65.
132. Wojtun S, Gil J, Gietka W, Gil M. Endoscopic sphincterotomy for choledocholithiasis: a prospective single-center study on the short-term and long-term treatment results in 483 patients. *Endoscopy* 1997;29:258–65.
133. Wölnerhanssen BK, Achermann C, Guenin MO, Kern B, et al. Zwölf Jahre laparoskopische Cholezystektomie: Ergebnisse einer prospektiven Studie an 4 498 an einer Klinik durchgeführten Cholezystektomien. *Chirurg* 2005;76:263–9.
134. Worthley CS, Toouli J. Gallbladder non-filling: an indication for cholecystectomy after endoscopic sphincterotomy. *Br J Surg* 1998;75:796–8.
135. Yokoyama T, Kodama T, Takesue Y, Hiya-ma E, et al. Basic and clinical studies on tazobactam/piperacillin in the surgical field. *Chemotherapy* 1994;42(Suppl 2):629–35.
136. Younes Z, Johnson DA. New developments and concepts in antimicrobial therapy for intra-abdominal infections. *Curr Gastroenterol Rep* 2000;2:277–82.