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Патютко Ю.И. (Москва, Россия)
Третьяк С.И. (Минск, Беларусь)
Тулин А.И. (Рига, Латвия)
Хабиб Наги (Лондон, Великобритания)
Цирикун В.В. (Москва, Россия)
Шаповалыч С.Г. (Москва, Россия)
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Address for Correspondence:
Prof. Galperin E.I.,
Hospital #7, Kolomensky pr, 4, Moscow, 115446 Russia.
Tel/Fax: +7 (499) 782-34-68. E-mail: ashred96@mail.ru
http://www.hepatoassociation.ru/journal
Vidar Ltd. 109028 Moscow, p/b 16.
Contacts: +7 (495) 782-04-34, +7 (495) 589-86-60, http://www.vidar.ru
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Use of Diode Laser for Liver Resection
(Experimental Study)

Kolyshev I.Yu., Artemiev A.I., Shabalin M.V., Mal’tseva A.P., Voskanyan S.E.

Center of Surgery and Transplantology, A.I. Burnazyan Federal Medical Biophysical Center of Federal Medical and Biological Agency of Russia; 23, Marshala Novikova str., Moscow, 123098, Russian Federation

Aim. To define opportunities of diode laser with wave length 0.97 µm in liver surgery to prevent postoperative complications.

Material and Methods. 90 rabbits were divided into 3 groups according to type of left liver lobe resection: intermitted laser (group 1), continuous laser (group 2) and bipolar coagulation (group 3). Following parameters of surgical procedure were studied: total duration of surgery, parenchyma dissection time, resected lobe volume, primary liver resection margin size, liver resection margin size by the end of experiment, blood loss, liver parenchyma hemostatic sutting after its dissection, liver parenchyma compression during its dissection, postoperative adhesive process, wound and intraabdominal infectious complications.

Results. Intermitted laser in liver resection decreased blood loss (Me (25%; 75%) = 3 ml (3; 4,5)) (р < 0.05), need for hemostatic sutting after parenchyma dissection (р < 0.05), incidence of wound and intraabdominal infectious complications, severity of adhesive process. Minimum duration of surgery was observed in group 3 (Me (25%; 75%) = 17 min (16; 19)) (р < 0.05). Liver resection margin evolution was faster and favorable in group 1.

Conclusion. Intermitted diode laser with wave length 0.97 µm is suitable method in order to perform liver parenchyma dissection in different clinical situations.

Key words: liver, resection, diode laser, coagulation, blood loss, complications.

References


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Photodynamic Therapy for Liver Cirrhosis (Experimental Study)

Garelik P.V.1, Mahiliavets E.V.2
1 Chair of General Surgery, 2 the 1st Department of Surgery of Grodno State Medical University, Ministry of Health of the Republic of Belarus; 80, Gorkogo str., Grodno, 230009, Republic of Belarus

Aim. To study the effects of photodynamic therapy for liver cirrhosis in experiment.

Material and Methods. Liver cirrhosis was induced in 44 white rats-males Wistar rats using CCl4 in the experiment. Photolon at a dose of 3.0 mg/kg was intravenously introduced (tail vein) in experimental groups of animals in 1 day after the last injection of CCl4. In 3 hours laser irradiation of liver was performed at a dose of 10 J/cm² with a wavelength of 670 nm. Morphological examination of liver tissue, electron microscopy, biochemical analysis of blood, determination of free amino acids in blood plasma were carried out.

Results. There was reduction of connective tissue in liver parenchyma after photodynamic therapy. Hepatocytes' alternative changes and their lipid infiltration were drastically reduced. Infiltration corresponded to <1.0 by Hornboll. Protein biosynthesis was activated. Ito cells was in passive state that indicated on positive effect of photodynamic therapy on the processes of collagen formation. Use of photodynamic therapy decrees total bilirubin in 2.16 times, alanine aminotransferase – 2.96 times, De Ritis coefficient – 2 times, alkaline phosphatase – 4.4 times, lactate dehy-drogenase – 3.1 times, gamma glutamyltranspeptidase – 2.86 times. Total level of amino acids decreased in 1.43 times, proteinogenic amino acids – in 1.43 times, non-essential – in 1.53 times, aromatic amino acids – in 1.72 times in experimental animals than in those with liver cirrhosis at the same time without treatment. Level of proline and hydroxyproline was reduced by 55% and 52% and it was significantly lower than in rats without treatment in 1.77 and 1.63 times, respectively.

Conclusion. The experimental study indicates on advisability to study this technique in clinical conditions in liver cirrhosis patients.

Key words: liver, liver cirrhosis, photodynamic therapy, liver morphology, electron microscopy, amino acids.

References


Received 29 January 2015.
The Use of Composite Material LitAr to Correct Liver Residual Cavities

Tret’yakov A.A., Khizhnyak I.I., Stadnikov A.A., Neverov A.N.
Chair of Surgery, Chair of Histology, Cytology, Embryology of Orenburg State Medical University, Health Ministry of Russia; 6, str. Sovietskaya, Orenburg, 460000, Russian Federation

Aim. Experimental and histological study the possibility of using composite material “LitAr” for sealing and elimination of residual liver cavities in combination with oxytocin including in case of infection.

Material and Methods. All studies were performed on 69 white laboratory male rats of Wistar line with weight of 280–300 g. 6 series of experiments were conducted. All operations were performed under ether mask anesthesia in compliance with the rules of asepsis and antisepsis. The animals were sacrificed by overdose of ether in 3, 7, 14 and 30 days after the start of the experiment. The site of composite material “LitAr” implantation was dissected for further study using light microscopy, immunocytochemical (identification of pro- and antiapoptotic genes p53, Bcl-2, caspasa-3, proliferative protein Ki-67 expression) and electron microscopic analysis.

Results. Implantation of composite material “LitAr” into liver residual cavity stimulates reparative histogenesis that leads to partial filling of defect by connective tissue elements and organotypic structures (newly formed liver cells), but does not limit the development of purulent-necrotic processes in infected residual liver cavity. The use of oxytocin in filling of residual liver cavity with “LitAr” material provides adequate conditions for the implementation of histochemically positive influence on reparative histogenesis in histostructures of liver and bile ducts including in case of infection of cavity. It results active proliferation of undifferentiated tissue, regenerative hypertrophy of hepatocytes in the area adjacent to the cavity, increase of their mitotic activity and filling of residual cavity by connective tissue elements and organotypic structures.

Conclusion. Thus, the use of collagen composite “LitAr” combined with oxytocin and antibiotics provides the most positive influence on reparative histogenesis in histostructures of liver and bile ducts including in case of infection. It results active proliferation of undifferentiated tissue, regenerative hypertrophy of hepatocytes in the area adjacent to the cavity, increase of their mitotic activity and filling of residual cavity by connective tissue elements and organotypic structures.

Key words: liver, bile ducts, residual cavity, oxytocin, regeneration, infection, antibiotics.
Microwave Ablation in Combined Treatment of Primary and Metastatic Liver Tumors

City Clinical Hospital №57 of Moscow Health Department; 32, 11th Parkovaya str., Moscow, 105077, Russian Federation

Aim. To increase the effectiveness of treatment of patients with primary and metastatic liver cancer.

Material and Methods. Microwave ablation was performed in 29 patients including 13 cases of hepatocellular carcinoma stage 0-A (by Barcelona classification and TNM) and 16 patients with colorectal cancer and liver metastases stage I (by Gennari). For microwave ablation of liver tumors AveCure MWG881 (MedWaves) device was used. Procedure was performed via percutaneous transhepatic approach (25), under ultrasonic guidance and intraoperatively simultaneously with liver resection in 4 cases. Effectiveness was estimated using CT and sonography.

Results. There were no deaths. We observed following complications: moderate bleeding from the point of needle catheter entry that has stopped independently in 1 case; residual cavity formed in one case that did not require additional surgery. Intrahepatic hematoma was diagnosed in 1 case. Burns of the skin were revealed in 2 cases. The average hospital stay was 7 days. Local recurrences after ablation were not observed. 1- and 2-year survival was 78.5% and 63.3% respectively.

Conclusion. Microwave ablation in patients with primary and secondary liver cancer and concomitant cirrhosis increases 1- and 2-year survival. Percutaneous microwave ablation reduces the incidence of complications in high risk patients due to low invasiveness and less trauma.

Key words: liver, primary cancer, metastases, ablation, microwave destruction, minimally invasive techniques.

References

Endoscopic Transgastric Drainage of Liquid Congestions and Post-Necrotic Cysts in Acute Pancreatitis

Lubyansky V.G.¹, Nasonov V.V.²

¹ Chair of Hospital Surgery of Altai State Medical University, Health Ministry of the Russian Federation; 40, Lenina str., Barnaul, 656038, Russian Federation
² Altai Regional Clinical Hospital; 2, Lyapidevsky str., Barnaul, 656024, Russian Federation

Aim. To develop methods of transgastric endoscopic drainage of liquid congestions and post-necrotic cysts in pancreatic necrosis and to estimate results of treatment.

Material and Methods. Drainage of post-necrotic cysts and liquid congestions has been carried out in 60 patients. 34 patients underwent external drainage, 26 patients had EUS-assisted endoscopic transgastric drainage. Stages of post-necrotic cysts formation have been studied in 40 patients. Technique of endoscopic drainage included detection of cyst location relatively to gastric lumen using endosonography. The shortest trajectory between gastric lumen and cyst in avascular zone was chosen to apply cystogastroanastomosis. EUS-assisted cystogastrostomy was performed in 15 patients, in 5 cases cystogastrostomy was supplemented by stenting; 9 patients underwent transgastric puncture of cysts and liquid congestions, 5 of them had necrsequesterectomy.

Results. External drainage was associated with external pancreatic fistula in 7 (18.9%) patients. External pancreatic fistula accompanied by hard-healing wound in the area of postoperative scar was observed in 3 (8%) patients. One patient (2.7%) suffered from external biliary fistula, 1 patient died due to multiple organ failure. There were no deaths after transgastric drainage.

Conclusion. Transgastric drainage of post-necrotic cysts was not accompanied by deaths. If sequesters are present sanation of the cyst's cavity and stenting are necessary.

Key words: pancreas, pancreatic necrosis, post-necrotic cyst, endoscopic ultrasonography, cystogastroanastomosis.

References
Controversial Aspects of Diagnosis and Surgical Treatment of Suspected Ductal Cholangiocarcinoma

Granov D.A., Borovik V.V., Timergalin I.V.

Division of Interventional Radiology and Operative Surgery, FSBI Russian Research Center for Radiology and Surgical Technologies, Russian Federation; 70, Leningradskaya str., s. Pesochniy, Saint-Petersburg, 197758, Russian Federation

Aim. To discuss controversial aspects of diagnosis and surgical treatment of suspected ductal cholangiocarcinoma using several clinical cases.

Material and Methods. Three cases of radically-operated patients with ductal cholangiocarcinoma are presented here. Postoperative morphologic examination did not confirm the diagnosis in all these cases.

Conclusion. A choice of surgical volume should not be based only on morphologic data, especially on preoperative data. Preoperative morphologic diagnosis is not always possible. Significant increase of CA19-9 level allows to consider an availability of cholangiocarcinoma but its normal values don’t exclude tumor either. It is necessary to take into account the functional state of liver and morphologic changes of removed liver lobe. Pancreatic head sparing surgery seems to be important in case of distal cholangiocarcinoma that will directly effect surgery volume. Therefore, preoperative morphologic diagnosis is of great value. Adequate and good-quality radical surgery for suspected Klatskin’s tumor or cholangiocarcinoma has main indisputable advantage. It allows to cure a patient with benign disease and gives a chance for a positive long-term prognosis in case of cancer. Such approach should be individual and used in specialized centres.

Key words: liver, bile ducts, ductal cholangiocarcinoma, Klatskin’s tumor, hemihepatectomy, cholangiojejunostomy, pancreatoduodenectomy, morphologic study.

Granov Dmitriy Anatol`evich – Doct. of Med. Sci., Professor, Corresponding-member of RAS, Head of the Division of Interventional Radiology and Operative Surgery, FSBI Russian Research Center for Radiology and Surgical Technologies, Head of the Chair of Radiology and Surgical Technologies of Pavlov First Saint Petersburg State Medical University. Borovik Vladimir Vladimirovich – Cand. of Med. Sci., Leading Researcher at the Division of Interventional Radiology and Operative Surgery, FSBI Russian Research Center for Radiology and Surgical Technologies, Associate Professor at the Chair of Radiology and Surgical Technologies, Pavlov First Saint Petersburg State Medical University. Timergalin Ilya Vladimirovich – Cand. of Med. Sci., Science Employee at the Division of Interventional Radiology and Operative Surgery, FSBI Russian Research Center for Radiology and Surgical Technologies, Associate Professor at the Chair of Radiology and Surgical Technologies, Pavlov First Saint Petersburg State Medical University.

For correspondence: Timergalin Ilya Vladimirovich – Apt. 18/3, 180, Uchitelskaya str., Saint-Petersburg,195269, Russian Federation. Phone: +7-905-262-80-60. E-mail: ilya-vma@yandex.ru

References

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Surgical Treatment of Iatrogenic Lesions of the Biliary Tract in Patients with Chronic Opisthorchosis

Merzlikin N.V.¹, Tsakhi V.F.¹, Brazhnikova N.A.², Podgornov V.E.², Pak V.N.², Shelepov S.V.², Bushlanov P.S.¹

¹Chair of Surgical Diseases of Pediatric Faculty, Siberian State Medical University, Ministry of Health of Russia; 2, str. Moscow tract, Tomsk, 634050, Russian Federation
²City Clinical Hospital №3; 3, str. Nakhimova, Tomsk, 634045, Russian Federation
³Tomsk Regional Hospital; 96, str. I. Chernykh, Tomsk, 634063, Russian Federation

Aim. To determine incidence and causes of iatrogenic injuries of bile ducts during cholecystectomy in patients with chronic opisthorchosis and features of its surgical correction.

Materials and Methods. The results of 7147 cholecystectomies were analyzed. General clinical and modern instrumental methods were used in survey. Statistical analysis was performed using software package Statgraphics 6.0 Plus for Windows.

Results. Bile ducts injuries were observed in 41 (0.57%) patients with gallstone disease including 20 (1.13%) cases with concomitant chronic opisthorchosis and in 21 (0.36%) patients without opisthorchosis. Traditional and laparoscopic cholecystectomy was associated with bile ducts injuries in 0.65% and 0.43% of cases respectively. Large traumas were prevalent (61%) according to the McMachon classification (1995). Pathognomonic pathologic changes of the biliary system and infiltrative changes in the gall bladder neck were main reasons of ducts injuries in case of opisthorchosis and without it respectively. Recovery operations were performed in 55.8% of cases. Reconstructive interventions were performed in 23.3% of patients. Posttraumatic cicatrical strictures of ducts and biliodigestive anastomoses occured 2.6 times more frequent in patients with opisthorchosis. Postoperative mortality was 33.3%, in patients without opisthorchosis – 10.5% (p < 0.05).

Conclusion. Chronic opisthorchosis increases the frequency of duct injuries during cholecystectomy in 3.1 times. The disease complicates technique of recovery and reconstructive operations and increases postoperative mortality.

Key words: liver, gall bladder, cholelithiasis, cholecystectomy, iatrogenic lesion, opisthorchosis, bile ducts, drainage, reconstructive surgical procedure.

Merzlikin Nikolai Vasilevich – Doct. of Med. Sci., Professor, Head of the Chair of Surgical Diseases of Pediatric Faculty, Siberian State Medical University. Tsakhi Valentina Fedorovna – Doct. of Med. Sci., Professor of the Chair of Surgical Diseases of Pediatric Faculty, Siberian State Medical University. Brazhnikova Nadezhda Arkhipovna – Doct. of Med. Sci., Professor of the Chair of Surgical Diseases of Pediatric Faculty, Siberian State Medical University. Klubnikova Julia Aleksandrovna – Cand. of Med. Sci., Surgeon at the City Clinical Hospital №3. Podgornov Viktor Fedorovich – Endoscopist at the Tomsk Regional Clinical Hospital. Pak Vladimir Nikolaevich – Anesthesiologist at the City Clinical Hospital №3. Shelepov Svyatoslav Vladimirovich – Surgeon at the City Clinical Hospital №3. Bushlanov Pavel Sergeevich – Clinical Ordinator at the Chair of Surgical Diseases, Faculty of Pediatrics, Siberian State Medical University.

For correspondence: Merzlikin Nikolai Vasilevich – 60, 27/1, str. Irkutsk tract, Tomsk, 634049, Russian Federation. Phone: +7-3822-44-53-44, +7-960-969-99-40. E-mail: nikolai_merzlikin@mail.ru

References


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Current Approach to Mechanical Jaundice Management

Aidemirov A.N.1,2, Shakhnazaryan N.G.2, Vafin A.Z.1, Shakhnazaryan A.M.3
1 Chair of Hospital Surgery of the Stavropol State Medical University of Russian Health Ministry; 310, Mira str., Stavropol, 355000, Russian Federation
2 Stavropol Regional Oncology Dispensary; 182a, Octyabreckaya str., Stavropol, 355047, Russian Federation
3 Stavropol Regional Clinical Hospital; 1, Semashko str., Stavropol, 355000, Russian Federation

Aim. To improve management of obstructive jaundice of various origin by improving the method of detoxification and application of the new device to return bile into the digestive tract.

Materials and Methods. Treatment of 150 patients was analyzed. Two groups of patients with obstructive jaundice were compared. Control group consisted of traditional methods of detoxification and biliary drainage via laparotomy or minimally invasive techniques. Combined treatment including infusion therapy whose volume was calculated depending on body weight, blood biochemical parameters and level of bilirubinemia was applied in the second group. Biliary decompression was performed using minimally invasive methods and developed in the clinic new device to return bile into the digestive tract.

Results. Improved outcomes in the main group were achieved due to introduction of new set of therapeutic activities carried out at all stages of treatment. Incidence of postoperative complications was 11.8% and 7.6% in control and main groups respectively. Average hospital-stay was 16 and 11 days in both groups respectively.

Conclusion. The results confirm high efficiency of improved method of detoxification and new device to return bile into the digestive tract, that allows to recommend them for wider application in complex treatment of patients with obstructive jaundice.

Key words: liver, bile ducts, bilirubin, obstructive jaundice, infusion therapy, detoxification, bile return.
X-ray Surgery for Extrahepatic Bile Ducts Injuries

Okhotnikov O.I.1,2, Grigoriev S.N.2, Yakovleva M.V.1,2

1 Chair of Surgical Diseases of Faculty of Post-qualifying Education of Kursk State Medical University, Ministry of Health of the Russian Federation; 3, K. Marks str., Kursk, 305001, Russian Federation
2 Kursk Regional Clinical Hospital; 45a, Sumskaya str., Kursk, 305007, Russian Federation

Aim. To increase efficacy of X-ray surgical treatment of “fresh” bile ducts injuries.

Material and Methods. Antegrade X-ray surgical intervention for iatrogenic bile ducts injuries during cholecystectomy or stomach resection was performed in 12 patients. Bile duct injury has been diagnosed for 5 days after previous surgery. Percutaneous transhepatic biliary drainage was carried out in all cases including 3 patients with non-dilated intrahepatic bile ducts.

Results. Biliodigestive anastomosis with temporary preservation of transhepatic cholangiostomy in postoperative period was carried out in 5 patients with full transection of common bile duct in 1.5–3 months after antegrade transhepatic cholangiostomy. Antegrade recovery of common bile duct by the methods of intervention radiology (transhepatic biliary drainage dislocation in duodenum) was performed in 5 patients. Retrograde endoscopic common bile duct stenting using plastic stent was performed in 2 patients after antegrade biliary drainage. There were no deaths after surgery in this series. Follow-up varied from 3 months to 8.5 years.

Conclusion. Early (within 5 days) iatrogenic bile duct injuries and sufficient surgeon’s experience suppose reconstructive surgery with preservation of percutaneous transhepatic biliary drainage that prevents biliodigestive Anastomosis failure in postoperative period. Percutaneous transhepatic biliary drainage should be transformed in antegrade biliodigestive stent in case of absence of technical or temporary possibility for early reconstructive surgery. Antegrade biliodigestive stenting combined with retrograde endoscopic stenting or without it should be preferred in surgical management of tangential iatrogenic bile duct injuries. Dissected common bile duct may be also restored using prolonged antegrade biliodigestive stenting.

Key words: liver, bile ducts, cholangiostomy, iatrogenic injury, antegrade biliodigestive stenting.

References


Endoscopic Transpapillary Treatment of Choledocholithiasis

Khrustaleva M.V.1, Dekhtyar M.A.1, Yagubyan G.K.2

1 Department for Endoscopy of acad. B.V. Petrovsky Russian Research Center for Surgery; 2, Abrikosovskii per., Moscow, 119992, Russian Federation
2 Department for Endoscopy, Municipal Clinical Hospital №71; 14, Mozhayskoe shosse, Moscow, 121374, Russian Federation

Aim. To evaluate the results of endoscopic treatment of choledocholithiasis in clinically difficult cases.

Material and Methods. We have analyzed treatment of 322 patients with choledocholithiasis. EPT, mechanical lithotripsy, nasobiliary drainage and transpapillary stenting were applied to restore biliary flow-out and sanitation of bile duct. Effectiveness of endoscopic stone removal was compared in 2 groups of patients: group 1 – patients with large stones and normal anatomy of periampullary zone and group 2 – patients with choledocholithiasis and periampullary diverticula, strictures and stenoses of bile ducts.

Results. Endoscopic sphincterotomy was performed in 301 (97.4%) patients. In 88 (29.2%) patients with periampullary diverticula stones were removed using standard extractors, in other 213 (70.8%) cases attempts of mechanical lithotripsy were made. The stones were successfully destroyed in 196 (92%) patients. Lithotripsy was not successful in 14 patients of group 1 and 3 patients of group 2. Herewith lithotripsy efficiency was not significantly different in both groups. Complications of endoscopic interventions were observed in 30 (9.9%) patients including 8 cases of bleeding after endoscopic sphincterotomy, 12 – acute pancreatitis, 12 – adverse course of cholangitis and in 2 cases – impaction of lithotripter basket with a captured stone. Incidence of complications in group 1 was 13.5%, in group 2 – 6.1%. There is no mortality in our study.

Conclusion. Bile ducts sanitation was successful in 88% of patients. Endoscopic treatment was equally effective in both groups of patients.

Key words: cholangiolithiasis, mechanical jaundice, cholangitis, choledocholithiasis, periampullary diverticulum, bile duct stenosis, lithoextraction, mechanical lithotripsy.


For correspondence: Khrustaleva Marina Valeryevna – 2, Abrikosovskii per., Moscow, 119992, Russian Federation. Phone: +7-916-675-31-86. E-mail: m.khrustaleva@mail.ru

References


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Retrograde Endoscopic Interventions in Obstructive Jaundice Management

Gabriel S.A., Durleshter V.M., Guchetl A.Ya., Andreev A.V., Dyn'ko V.Yu., Gol'fand V.V.

State Budget Institution of Health Care “Regional Clinical Hospital №2”, Ministry of Health of Krasnodar Region; 6/2, Krasnyh Partizan str., Krasnodar, 350012, Russian Federation

Aim. To determine the effectiveness of endoscopic transpapillary techniques in diagnosis and treatment of patients with obstructive jaundice of various origin.

Materials and Methods. We analyzed the effectiveness of endoscopic diagnosis and treatment of patients with obstructive jaundice for the period 2008–2012. The total number of patients was 900. Patients with mechanical obstacle for bile outflow and bilirubin level over 20 mmol/l were included. We used retrograde cholangiopancreatography (ERCP), endoscopic papillotomy (EPT), endoscopic mechanical lithotripsy and lithoextraction (EMLE, EMLT), nasobiliary drainage (NBD), probing and stenting of bile ducts, endoscopic contact electrohydraulic lithotripsy, balloon dilatation of the common bile duct.

Results. Interventions were effective in 874 patients (97.11%). Complications occurred in 31 patients (3.44%). Mortality was absent.

Conclusion. Endoscopic transpapillary interventions are highly effective in patients with obstructive jaundice. Instrumental hardware equipment and complex application have a great importance in this case.

Key words: cholelithiasis, cholangiolithiasis, choledocholithiasis, obstructive jaundice, bile ducts, major duodenal papilla, endoscopic interventions.

References

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Diagnosis and Treatment of Postoperative Bile Leakage

Kurbonov K.M., Daminova N.M., Makhmadov F.I.

Chair of Surgical Diseases №1 of Abu Ali ibn Sina the Tajik State Medical University, Dushanbe, Tajikistan; 139, Rudaki ave., Dushanbe, 734003, The Republic of Tajikistan

Aim. Improving the immediate results of surgical treatment of liver and biliary tract diseases.

Material and Methods. Treatment of 142 patients with postoperative bile leakage was analyzed. Sonography, ERCP, gastroscopy, CT and MRI were used in diagnostics. There were 62 (43.7%) men and 80 (56.3%) women. Postoperative bile leakage was caused by unrepaired biliary hypertension in 14.8% of cases, undiagnosed and unliquidated cystobiliary fistulas – in 40.1%, traumatic lesions of liver and biliary tract – in 10.6 %, clips and drainage tubes dislocation – in 12%, suture failure of cystic duct, common bile duct, biliodigestive anastomoses and duodenal stump – in 22.5%.

Results. Bile leakage was treated taking into account its severity and presence of bile hypertension. Endoscopic methods, EPST, biendoscopic interventions (relaparoscopy with cystic duct re-clipping), transduodenal replacement showed high efficiency. Isolated Roux loop hepaticojejunostomy was performed in severe incurable postoperative bile leakage. Complications and deaths were absent.

Conclusion. Treatment of patients with postoperative bile leakage requires an individual approach and should include conservative measures, endoscopic and surgical methods of correction.

Key words: liver, bile ducts, bile leakage, cystobiliary fistula, endoscopic interventions.
The autoimmune pancreatitis was described in 1961 as “a primary inflammatory sclerosis of the pancreas”. Subsequent reports have described this disease as lymphoplasmacytic sclerosing pancreatitis, chronic sclerosing pancreatitis, nonalcoholic duct-destructive pancreatitis, inflammatory pseudotumor of pancreas, etc. The concept of autoimmune pancreatitis was proposed by Yoshida et al. in 1995. Numerous clinical, serological, radiological and pathological studies were conducted. Diagnostic criteria, serological markers and pathological features were introduced to facilitate autoimmune pancreatitis patients management. Also data were obtained indicating autoimmune pancreatitis as a part of new clinicopathological entity - IgG4-related sclerosing disease. Important issue is surgical treatment of autoimmune pancreatitis which is performed in case of suspected pancreatic cancer as a rule. Thus, autoimmune pancreatitis is an actual problem of modern medicine and requires further study.

**Key words:** pancreas, autoimmune pancreatitis, diagnosis, international consensus diagnostic criteria for autoimmune pancreatitis, prognosis, recurrence, steroid therapy, surgical treatment.

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**References**


CASE REPORTS

Schwannoma of Uncinate Process of Pancreas

Butkevich A.C., Sorokin M.N., Bogdanov S.N., Zadoyan Yu.S., Dremin D.A.
The Main Military Clinical Hospital of Military Unit 93998, Golitsino; 48, Petrovskoe shosse, Golitsino, Moscovskaya Oblast, 143040, Russian Federation

Aim. To present case report of effective surgical treatment of rare tumor of pancreatic uncinate process.

Conclusion. It is presented clinical observation of pancreatic schwannoma in 40 years old patient. Urgent histopathological examination during surgery makes it possible to carry out organ-sparing operation (uncus-preserving tumor enucleation). Data of tumor's pathogenesis and literature review are presented.

Key words: pancreas, schwannoma, resection, tumor enucleation.

References


For correspondence: Butkevich Alexander Tsezarevich – 13 – 2 – 268, 8th Tekstilschikov str., Moscow, 109129, Russian Federation. Phone: +7-916-533-12-50. E-mail: leg_o@mail.ru

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Pavlovskiy A.V., Popov S.A., Shapoval S.V., Granov D.A., Moiseenko V.E.

Division of Interventional Radiology and Operative Surgery, FSBI “Russian Research Center for Radiology and Surgical Technologies”, Health Ministry of the Russian Federation

It is presented the case report of long-term survival of patient operated for pancreatic adenocarcinoma complicated by postoperative pancreatic necrosis. This fact required prolonged therapeutic critical care and numerous additional urgent surgical interventions including total pancreatectomy. Patient was discharged in 57 days after radical surgery. By this moment follow-up is 8 years and there are no signs of tumor recurrence. Case report persuasively shows efficacy of radical operations in patients with pancreatic cancer and need for timely pancreatectomy in severe postoperative pancreatic necrosis.

Key words: pancreas, pancreatic cancer, pancreaticoduodenectomy, pancreatic necrosis, pancreatectomy, survival.

References


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TO CONTENTS
Pancreatic Hemangioma

A.V. Vishnevsky Institute of Surgery; 27, B. Serpukhovskaya str., Moscow, 117997, Russian Federation

Hemangioma is extremely seldom localized in pancreas. In the analysis of PubMed, Scopus and eLibrary databases 53 cases of pancreatic hemangioma have been revealed since 1924. Tumors are predominantly revealed in women aged from 30 till 79 years. All radiological diagnostic methods may be used to diagnose pancreatic hemangioma. Diagnostic criteria don’t differ from those in case of other localizations of hemangioma. MRI is the most effective method of pancreatic hemangioma diagnostics because it gives the chance to diagnose neoplasm effectively and also to verify a phase of its development without radiation exposure. Literature review and case report are presented in the article.

Key words: hemangioma, pancreas, clinic, ultrasonic diagnosis, CT, MRI.

References


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Abstracts of Current Foreign Publications

Akhaladze G.G., Akhaladze D.G.

Akhaladze Guram Germanovich – Professor, Chief Resiercher of the Department of Surgery and Surgical Technologies in Oncology of the Russian Scientific Center of Rentgenoradiology. Akhaladze Dmitriy Guramovich – Cand. of Med. Sci., Chief of the 2-nd Surgical Department of V.I. Shumakov Federal Research Center of Transplantology and Artificial Organs Ministry of Health of the Russian Federation.

For correspondence: Akhaladze Guram Germanovich – 4, Kolomenskiy proezd, Moscow, 115446, Russia.
Phone: +7-499-782-30-83. E-mail: gur371ax@gmail.com

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