

World Journal of *Clinical Cases*

World J Clin Cases 2021 June 26; 9(18): 4460-4880



OPINION REVIEW

- 4460 Surgery for pancreatic tumors in the midst of COVID-19 pandemic

Kato H, Asano Y, Arakawa S, Ito M, Kawabe N, Shimura M, Hayashi C, Ochi T, Yasuoka H, Higashiguchi T, Kondo Y, Nagata H, Horiguchi A

REVIEW

- 4467 Roles of exosomes in diagnosis and treatment of colorectal cancer

Umwali Y, Yue CB, Gabriel ANA, Zhang Y, Zhang X

MINIREVIEWS

- 4480 Dynamics of host immune responses to SARS-CoV-2

Taherkhani R, Taherkhani S, Farshadpour F

- 4491 Current treatment for hepatitis C virus/human immunodeficiency virus coinfection in adults

Laiwatthanapaisan R, Sirinawasatien A

- 4500 Anti-tumor effect of statin on pancreatic adenocarcinoma: From concept to precision medicine

Huang CT, Liang YJ

- 4506 Roles of vitamin A in the regulation of fatty acid synthesis

Yang FC, Xu F, Wang TN, Chen GX

ORIGINAL ARTICLE**Basic Study**

- 4520 Identification of the circRNA-miRNA-mRNA regulatory network and its prognostic effect in colorectal cancer

Yin TF, Zhao DY, Zhou YC, Wang QQ, Yao SK

- 4542 Tetramethylpyrazine inhibits proliferation of colon cancer cells *in vitro*

Li H, Hou YX, Yang Y, He QQ, Gao TH, Zhao XF, Huo ZB, Chen SB, Liu DX

Case Control Study

- 4553 Significance of highly phosphorylated insulin-like growth factor binding protein-1 and cervical length for prediction of preterm delivery in twin pregnancies

Lan RH, Song J, Gong HM, Yang Y, Yang H, Zheng LM

Retrospective Cohort Study

- 4559** Expected outcomes and patients' selection before chemoembolization—"Six-and-Twelve or Pre-TACE-Predict" scores may help clinicians: Real-life French cohorts results

Adhoue X, Larrey E, Anty R, Chevallier P, Penaranda G, Tran A, Bronowicki JP, Raoul JL, Castellani P, Perrier H, Bayle O, Monnet O, Pol B, Bourliere M

Retrospective Study

- 4573** Application of intelligent algorithms in Down syndrome screening during second trimester pregnancy
Zhang HG, Jiang YT, Dai SD, Li L, Hu XN, Liu RZ
- 4585** Evaluation of a five-gene signature associated with stromal infiltration for diffuse large B-cell lymphoma
Nan YY, Zhang WJ, Huang DH, Li QY, Shi Y, Yang T, Liang XP, Xiao CY, Guo BL, Xiang Y
- 4599** Efficacy of combination of localized closure, ethacridine lactate dressing, and phototherapy in treatment of severe extravasation injuries: A case series
Lu YX, Wu Y, Liang PF, Wu RC, Tian LY, Mo HY
- 4607** Observation and measurement of applied anatomical features for thoracic intervertebral foramen puncture on computed tomography images
Wang R, Sun WW, Han Y, Fan XX, Pan XQ, Wang SC, Lu LJ
- 4617** Histological transformation of non-small cell lung cancer: Clinical analysis of nine cases
Jin CB, Yang L
- 4627** Diagnostic value of amygdala volume on structural magnetic resonance imaging in Alzheimer's disease
Wang DW, Ding SL, Bian XL, Zhou SY, Yang H, Wang P
- 4637** Comparison of ocular axis and corneal diameter between entropion and non-entropion eyes in children with congenital glaucoma
Wang Y, Hou ZJ, Wang HZ, Hu M, Li YX, Zhang Z

Observational Study

- 4644** Risk factors for postoperative delayed gastric emptying in ovarian cancer treated with cytoreductive surgery and hyperthermic intraperitoneal chemotherapy
Cui GX, Wang ZJ, Zhao J, Gong P, Zhao SH, Wang XX, Bai WP, Li Y
- 4654** Clinical characteristics, gastrointestinal manifestations and outcomes of COVID-19 patients in Iran; does the location matters?
Mokarram P, Dalivand MM, Pizuorno A, Aligolighasemabadi F, Sadeghdoust M, Sadeghdoust E, Aduli F, Oskrochi G, Brim H, Ashktorab H
- 4668** AWGS2019 vs EWGSOP2 for diagnosing sarcopenia to predict long-term prognosis in Chinese patients with gastric cancer after radical gastrectomy
Wu WY, Dong JJ, Huang XC, Chen ZJ, Chen XL, Dong QT, Bai YY

Prospective Study

- 4681** Clinical outcomes and 5-year follow-up results of keratosis pilaris treated by a high concentration of glycolic acid

Tian Y, Li XX, Zhang JJ, Yun Q, Zhang S, Yu JY, Feng XJ, Xia AT, Kang Y, Huang F, Wan F

Randomized Controlled Trial

- 4690** Tenofovir disoproxil fumarate in Chinese chronic hepatitis B patients: Results of a multicenter, double-blind, double-dummy, clinical trial at 96 weeks

Chen XF, Fan YN, Si CW, Yu YY, Shang J, Yu ZJ, Mao Q, Xie Q, Zhao W, Li J, Gao ZL, Wu SM, Tang H, Cheng J, Chen XY, Zhang WH, Wang H, Xu ZN, Wang L, Dai J, Xu JH

SYSTEMATIC REVIEWS

- 4700** Mesenteric ischemia in COVID-19 patients: A review of current literature

Kerawala AA, Das B, Solangi A

- 4709** Role of theories in school-based diabetes care interventions: A critical review

An RP, Li DY, Xiang XL

CASE REPORT

- 4721** Alport syndrome combined with lupus nephritis in a Chinese family: A case report

Liu HF, Li Q, Peng YQ

- 4728** Botulinum toxin injection for Cockayne syndrome with muscle spasticity over bilateral lower limbs: A case report

Hsu LC, Chiang PY, Lin WP, Guo YH, Hsieh PC, Kuan TS, Lien WC, Lin YC

- 4734** Meigs' syndrome caused by granulosa cell tumor accompanied with intrathoracic lesions: A case report

Wu XJ, Xia HB, Jia BL, Yan GW, Luo W, Zhao Y, Luo XB

- 4741** Primary mesonephric adenocarcinoma of the fallopian tube: A case report

Xie C, Shen YM, Chen QH, Bian C

- 4748** Pancreas-preserving duodenectomy for treatment of a duodenal papillary tumor: A case report

Wu B, Chen SY, Li Y, He Y, Wang XX, Yang XJ

- 4754** Pheochromocytoma with abdominal aortic aneurysm presenting as recurrent dyspnea, hemoptysis, and hypotension: A case report

Zhao HY, Zhao YZ, Jia YM, Mei X, Guo SB

- 4760** Minimally invasive removal of a deep-positioned cannulated screw from the femoral neck: A case report

Yang ZH, Hou FS, Yin YS, Zhao L, Liang X

- 4765** Splenic Kaposi's sarcoma in a human immunodeficiency virus-negative patient: A case report

Zhao CJ, Ma GZ, Wang YJ, Wang JH

- 4772** Neonatal syringocystadenoma papilliferum: A case report
Jiang HJ, Zhang Z, Zhang L, Pu YJ, Zhou N, Shu H
- 4778** Disappeared intralenticular foreign body: A case report
Xue C, Chen Y, Gao YL, Zhang N, Wang Y
- 4783** Femoral neck stress fractures after trampoline exercise: A case report
Nam DC, Hwang SC, Lee EC, Song MG, Yoo JI
- 4789** Collision carcinoma of the rectum involving neuroendocrine carcinoma and adenocarcinoma: A case report
Zhao X, Zhang G, Li CH
- 4797** Therapeutic effect of autologous concentrated growth factor on lower-extremity chronic refractory wounds: A case report
Liu P, Liu Y, Ke CN, Li WS, Liu YM, Xu S
- 4803** Cutaneous myiasis with eosinophilic pleural effusion: A case report
Fan T, Zhang Y, Lv Y, Chang J, Bauer BA, Yang J, Wang CW
- 4810** Severe hematuria due to vesical varices in a patient with portal hypertension: A case report
Wei ZJ, Zhu X, Yu HT, Liang ZJ, Gou X, Chen Y
- 4817** Rare coexistence of multiple manifestations secondary to thalamic hemorrhage: A case report
Yu QW, Ye TF, Qian WJ
- 4823** Anderson-Fabry disease presenting with atrial fibrillation as earlier sign in a young patient: A case report
Kim H, Kang MG, Park HW, Park JR, Hwang JY, Kim K
- 4829** Long-term response to avelumab and management of oligoprogression in Merkel cell carcinoma: A case report
Leão I, Marinho J, Costa T
- 4837** Central pontine myelinolysis mimicking glioma in diabetes: A case report
Shi XY, Cai MT, Shen H, Zhang JX
- 4844** Microscopic transduodenal excision of an ampullary adenoma: A case report and review of the literature
Zheng X, Sun QJ, Zhou B, Jin M, Yan S
- 4852** Growth hormone cocktail improves hepatopulmonary syndrome secondary to hypopituitarism: A case report
Ji W, Nie M, Mao JF, Zhang HB, Wang X, Wu XY
- 4859** Low symptomatic COVID-19 in an elderly patient with follicular lymphoma treated with rituximab-based immunotherapy: A case report
Łęcki S, Wyżgolik K, Nicze M, Georgiew-Nadziakiewicz S, Chudek J, Wdowiak K

- 4866** Adult rhabdomyosarcoma originating in the temporal muscle, invading the skull and meninges: A case report
Wang GH, Shen HP, Chu ZM, Shen J
- 4873** *Listeria monocytogenes* bacteremia in a centenarian and pathogen traceability: A case report
Zhang ZY, Zhang XA, Chen Q, Wang JY, Li Y, Wei ZY, Wang ZC

ABOUT COVER

Editorial Board Member of *World Journal of Clinical Cases*, Shingo Tsujinaka, MD, PhD, Assistant Professor, Senior Lecturer, Surgeon, Department of Surgery, Saitama Medical Center, Jichi Medical University, Saitama 330-8503, Japan. tsujinakas@omiya.jichi.ac.jp

AIMS AND SCOPE

The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

INDEXING/ABSTRACTING

The WJCC is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, PubMed, and PubMed Central. The 2020 Edition of Journal Citation Reports® cites the 2019 impact factor (IF) for WJCC as 1.013; IF without journal self cites: 0.991; Ranking: 120 among 165 journals in medicine, general and internal; and Quartile category: Q3. The WJCC's CiteScore for 2019 is 0.3 and Scopus CiteScore rank 2019: General Medicine is 394/529.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: Ji-Hong Lin; Production Department Director: Xiang Li; Editorial Office Director: Jin-Lai Wang.

NAME OF JOURNAL

World Journal of Clinical Cases

ISSN

ISSN 2307-8960 (online)

LAUNCH DATE

April 16, 2013

FREQUENCY

Thrice Monthly

EDITORS-IN-CHIEF

Dennis A Bloomfield, Sandro Vento, Bao-Gan Peng

EDITORIAL BOARD MEMBERS

<https://www.wjnet.com/2307-8960/editorialboard.htm>

PUBLICATION DATE

June 26, 2021

COPYRIGHT

© 2021 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS

<https://www.wjnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjnet.com/bpg/GerInfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjnet.com/bpg/GerInfo/288>

PUBLICATION MISCONDUCT

<https://www.wjnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjnet.com/bpg/GerInfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>



Microscopic transduodenal excision of an ampullary adenoma: A case report and review of the literature

Xiang Zheng, Qing-Jing Sun, Bo Zhou, Ming Jin, Sheng Yan

ORCID number: Xiang Zheng 0000-0003-2920-2282; Qing-Jing Sun 0000-0002-6916-5554; Bo Zhou 0000-0002-4139-5462; Ming Jin 0000-0001-8205-1044; Sheng Yan 0000-0002-4153-3546.

Author contributions: Zheng X and Sun QJ contributed equally to this work; Zheng X and Sun QJ reviewed the literature, acquired the data, and contributed to manuscript drafting; Zhou B and Jin M analyzed and interpreted the imaging findings and contributed to manuscript drafting; Yan S acquired the data and was responsible for revision of the manuscript for important intellectual content; all authors issued final approval for the version to be submitted.

Supported by Natural Science Foundation of Zhejiang Province, No. LQ19H100004.

Informed consent statement: Informed written consent was obtained from the patient for publication of this report and any accompanying images.

Conflict-of-interest statement: The authors declare that they have no conflict of interest to report.

CARE Checklist (2016) statement: The authors have read the CARE Checklist (2016), and the

Xiang Zheng, Bo Zhou, Ming Jin, Sheng Yan, Department of General Surgery, The Second Affiliated Hospital, School of Medicine, Zhejiang University, Hangzhou 310009, Zhejiang Province, China

Qing-Jing Sun, The Affiliated Hospital of Stomatology, School of Stomatology, Zhejiang University School of Medicine, and Key Laboratory of Oral Biomedical Research of Zhejiang Province, Hangzhou 310006, Zhejiang Province, China

Corresponding author: Sheng Yan, MD, PhD, Professor, Department of General Surgery, The Second Affiliated Hospital, School of Medicine, Zhejiang University, No. 88 Jiefang Road, Hangzhou 310009, Zhejiang Province, China. shengyan@zju.edu.cn

Abstract

BACKGROUND

Transduodenal local excision is an alternative treatment approach for benign ampullary tumors. However, this procedure has technical difficulties, especially during reconstruction of the pancreaticobiliary ducts. An operating microscope has been widely used by surgeons for delicate surgery due to its major advantages of magnification, illumination, and stereoscopic view. The application of an operating microscope in transduodenal excision of ampullary tumors has not been reported.

CASE SUMMARY

A 55-year-old woman was admitted for investigation of recurrent upper abdominal pain. Physical examination and laboratory tests found no abnormalities. Imaging identified a large mass in the descending part of the duodenum. Esophagogastroduodenoscopy revealed a 3.5-cm-sized villous growth over the major duodenal papilla. Pathology of the endoscopic biopsy indicated a villous adenoma with low-grade dysplasia. Microscopic transduodenal excision of the ampullary tumor was performed. The final pathological diagnosis was villous-tubular adenoma with low-grade dysplasia. The patient was discharged on postoperative day 12 after an uneventful recovery. Endoscopic retrograde cholangiopancreatography was performed 3 mo postoperatively and showed no bile duct or pancreatic duct strictures and no tumor recurrence. The patient is continuing follow-up at our clinic and remains well.

CONCLUSION

Operating microscope-assisted transduodenal local excision is a feasible and effective option for benign ampullary tumors.

manuscript was prepared and revised according to the CARE Checklist (2016).

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

Manuscript source: Unsolicited manuscript

Specialty type: Medicine, research and experimental

Country/Territory of origin: China

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): B
Grade C (Good): 0
Grade D (Fair): 0
Grade E (Poor): 0

Received: February 6, 2021

Peer-review started: February 6, 2021

First decision: March 14, 2021

Revised: March 27, 2021

Accepted: April 9, 2021

Article in press: April 9, 2021

Published online: June 26, 2021

P-Reviewer: Oley MH

S-Editor: Fan JR

L-Editor: Wang TQ

P-Editor: Ma YJ



Key Words: Operating microscope; Transduodenal local excision; Ampullary tumor; Endoscopic papillectomy; Pancreaticoduodenectomy; Case report

©The Author(s) 2021. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: Operating microscope-assisted transduodenal excision of ampullary tumors has not been reported. We present our experience of microscopic transduodenal local excision in a case of ampullary adenoma. The application of an operating microscope provides significant technical advantages, particularly in the reconstruction of pancreaticobiliary ducts. The successful outcome in this case suggests that microscopic transduodenal excision is feasible and effective for patients with ampullary tumors.

Citation: Zheng X, Sun QJ, Zhou B, Jin M, Yan S. Microscopic transduodenal excision of an ampullary adenoma: A case report and review of the literature. *World J Clin Cases* 2021; 9(18): 4844-4851

URL: <https://www.wjgnet.com/2307-8960/full/v9/i18/4844.htm>

DOI: <https://dx.doi.org/10.12998/wjcc.v9.i18.4844>

INTRODUCTION

Ampullary tumors have been increasingly encountered as esophagogastroduodenoscopy (EGD) is widely used in the clinic, of which adenomas are the most common tumors[1]. Complete resection of ampullary adenomas is necessary as they are potentially malignant[2]. Currently, there are three approaches to manage ampullary neoplasms: Endoscopic papillectomy (EP), pancreaticoduodenectomy (PD), and transduodenal excision. Although EP is globally recognized as the first choice for treatment of benign ampullary tumors, it can only be carried out on small tumors confined to the papilla and not involving the common bile duct or pancreatic duct[3, 4]. Traditional PD is a standard surgical approach for malignant ampullary tumors. However, the application of PD in patients with benign lesions remains controversial given the significant postoperative morbidity and mortality. Compared to PD, transduodenal excision of ampullary tumors offers significantly lower morbidity and mortality. Several reports have indicated that transduodenal excision can be used as an alternative treatment approach for benign or ampulla of Vater neoplasms[5-7]. However, widespread use of this procedure has failed as it is technically demanding. Suboptimal dissection and reconstruction of the pancreaticobiliary duct system can lead to tumor residues and life-threatening complications.

An operating microscope has the major advantages of magnification, illumination, and stereoscopic view, and is now widely used in various surgical sub-specialties such as neurosurgery, ophthalmology, plastic surgery, and orthopedics[8,9]. The application of high-definition microscopes has provided surgeons with greater anatomical detail, which is particularly helpful during the execution of finer dissection and reconstruction techniques, as is required when treating ampullary lesions. We report a case of operating microscope-assisted transduodenal excision of an ampullary tumor, and evaluate the safety and efficacy of this approach.

CASE PRESENTATION

Chief complaints

A 55-year-old woman was admitted to our hospital with a history of recurrent upper abdominal pain for 1 year. The patient had no symptoms of fever, nausea, vomiting, or weight loss.

History of present illness

The patient's symptoms started 1 year ago, with recurrent episodes of upper abdominal pain that were relieved spontaneously.

History of past illness

The patient had no previous medical history.

Personal and family history

The personal and family history was unremarkable.

Physical examination

The patient's physical examination was unremarkable.

Laboratory examinations

The laboratory findings, including liver function tests and tumor markers (carcinoembryonic antigen, alpha fetoprotein, and carbohydrate antigen 19-9), were all within normal limits.

Imaging examinations

On computed tomography (CT) (Figure 1A) and magnetic resonance imaging (Figure 1B), a large mass with contrast enhancement was observed in the descending part of the duodenum. On magnetic resonance cholangiography (Figure 1C), no cut-off sign or stricture was found on either the bile duct or pancreatic duct except for a mild dilation of the common bile duct.

Further diagnostic work-up

EGD revealed a 3.5-cm-sized villous growth over the major duodenal papilla (Figure 1D). Pathology of the endoscopic biopsy indicated a villous adenoma with low-grade dysplasia.

FINAL DIAGNOSIS

Based on the radiographic and pathological findings, an ampullary adenoma was diagnosed.

TREATMENT

Microscopic transduodenal excision of the ampullary tumor was performed (Figure 2). The patient was placed in the supine position under general anesthesia. After a midline laparotomy, the duodenum was mobilized with the Kocher maneuver. The ampullary lesion was identified by palpation of the descending part of the duodenum. A 4-cm longitudinal duodenotomy was performed over the anterolateral wall and stay sutures were then placed to keep the duodenotomy open (Figure 2A). A Zeiss operating microscope (OPM2 VARIO 700, Carl Zeiss Meditec AG, Jena, Germany) was used. The ampullary tumor was excised using monopolar cautery and microscopic scissors under the operating microscope (Figure 2B). The pancreaticobiliary duct was identified by high magnification, and dissected carefully to ensure an adequate margin (Figure 2C and D). The specimen was sent for intraoperative pathological examination with the tumor orientation details. Intraoperative frozen section confirmed a villous adenoma with a negative margin. The pancreaticobiliary duct was sutured to the surrounding duodenal mucosa with an interrupted 6/0 prolene suture to reconstruct the ampulla (Figure 2E). A gauge 12 silicone catheter was inserted through the orifice into the pancreatic duct for stenting, and was anchored with 5/0 PDS sutures. The duodenotomy incision was closed with a one-layer transverse suture with interrupted 5/0 prolene stitches (Figure 2F). Anterior and posterior silicone drains were placed near the duodenotomy. The operative time was 160 min. The blood loss was 30 mL.

OUTCOME AND FOLLOW-UP

Postoperative pathology showed a villous-tubular adenoma with low-grade dysplasia. The patient started to take a semi-fluid diet 6 d post-operation. An abdominal CT scan was performed on postoperative day 7, and showed no leakage or passage disturbance. The patient was discharged on postoperative day 12 after an uneventful recovery. An endoscopy was performed 3 mo after surgery to remove the pancreatic

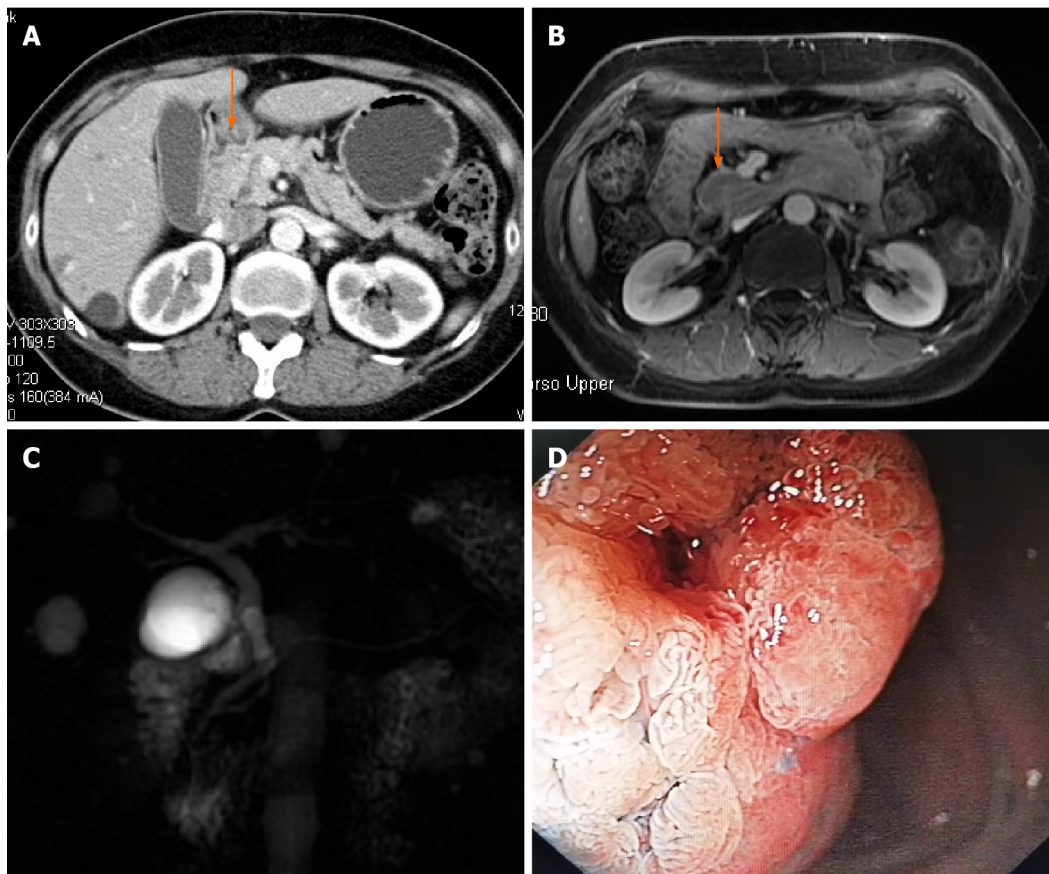


Figure 1 Preoperative examination of the ampullary tumor. A and B: Contrast-enhanced computed tomography and magnetic resonance imaging showing an enhanced lesion (arrow) located in the descending part of the duodenum; C: Magnetic resonance cholangiography revealing a mild dilation of the common bile duct, and no cut-off sign or stricture of either the bile duct or pancreatic duct; D: Endoscopic view of the ampullary adenoma.

duct stent, and endoscopic retrograde cholangiopancreatography was performed, which showed no recurrence of the ampullary lesion and no bile duct or pancreatic duct stricture. She is continuing follow-up at our clinic and remains well.

DISCUSSION

Adenomas are the most common ampullary tumors[10]. Complete resection is required to treat ampullary adenomas as they are premalignant[11]. Currently, the management strategies include EP, PD, and transduodenal excision. Although EP is an attractive option as it is minimally invasive, it is limited to patients with smaller lesions confined to the papilla and without involvement of the duodenal muscularis or pancreaticobiliary ducts. PD is a standard procedure for malignant ampullary tumors. However, the treatment of benign tumors by PD is still debated. It could be considered as overtreatment given the high postoperative morbidity (32.6%-57.6%)[12-15] and mortality (2%-5%)[16-19] rates associated with PD. Therefore, transduodenal excision has emerged as an alternative treatment option for ampullary adenomas.

Transduodenal excision has advantages over PD in terms of less invasiveness and organ preservation. Its safety and efficacy have been investigated in several case series [7,20,21]. The largest series of transduodenal excision was reported by the Heidelberg group[22]. Eighty-three patients were included in this study, of which 44 patients had adenomas. The postoperative morbidity and mortality rate were 24% and 1.2%, respectively, and were much lower than those following PD. A recent study reported by the Milan group confirmed the safety of transduodenal excision, with an overall morbidity rate of 44.4% and no mortality[6]. With regard to long-term outcomes, the local recurrence rate of adenomas after transduodenal excision was 4.5% in the Heidelberg study and 11.1% in the Milan study, lower than that following excision by EP (17%-45%) reported in a series including more than 20 cases[23-25]. These results suggest that transduodenal excision of ampullary tumors is an alternative treatment

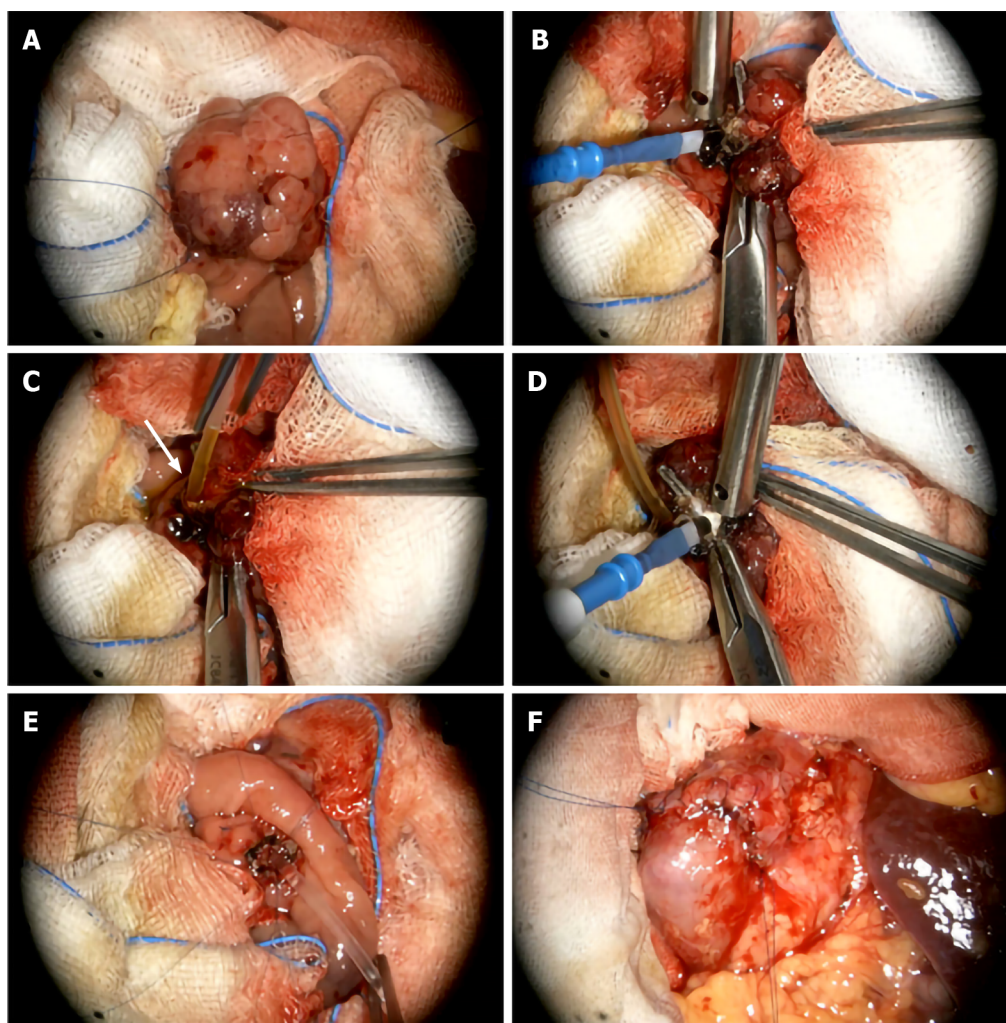


Figure 2 Steps of the surgical procedure under the operating microscope. A: Exposure of the duodenal papillary adenoma; B: Kelly forceps placed under the tumor to raise the ampulla of Vater; C: Identifying the pancreaticobiliary duct (arrow) by insertion of a silicone catheter. One orifice was created in this case; D: Dissecting the ampullary adenoma carefully to ensure an adequate margin; E: Suturing the pancreaticobiliary duct to the surrounding duodenal mucosa with 6/0 prolene sutures; F: Closure after the duodenotomy.

option in patients who are unsuitable for EP but too extensively treated by PD.

However, to date, there are limited reports on transduodenal excision in the English-language literature, and wide use of this procedure as standard has failed. This is due to the complex anatomy of the ampulla and the location of the tumor which is deep within the duodenum. In addition, the size of the pancreatic and biliary duct might be too small to be identified and delicately sutured to the duodenal mucosa. These features make the surgical procedure complex and technically demanding. Risks can arise from suboptimal dissection and reconstruction of the ampulla. In Lee *et al*[26], one (16.7%) of six patients developed biliary stricture 3 mo after the operation[26]. Operation-associated ductal strictures can be complicated by pancreatitis and cholangitis. The postoperative pancreatitis and cholangitis rate was 2.3% and 4.5%, respectively, in the Heidelberg study. In the Milan study, two (5.6%) of 36 patients developed acute pancreatitis postoperatively. In other studies, similar complications have been reported. Grobmyer *et al*[27] reported that three (10.3%) of 29 patients undergoing ampullectomy had postoperative pancreatitis[27]. Hong *et al* reported that one (3.8%) patient was readmitted with cholangitis 28 mo after the operation[21]. The difficulty in pancreaticobiliary duct reconstruction and the operation-associated complications prevent the widespread use of transduodenal excision.

Optical magnifying tools, such as laparoscopes, robot surgical systems, or operating microscopes, might be helpful when rebuilding the pancreaticobiliary duct system. Laparoscopic and robotic transduodenal excision of ampullary tumors is minimally invasive and facilitates recovery; however, only a few cases have been reported [26,28-31]. Transduodenal excision has been mainly performed by open laparotomy to date.

This is probably due to the difficulty in proper exposure of the ampulla and the complicated procedures involved in delicate resection and reconstruction of fine pancreaticobiliary structures. Microsurgery has been widely used in clinical surgery, and is particularly favorable in dealing with delicate tissues. The application of operating microscopes provides surgeons with a more magnified and clearer view of the anatomy. Thus, operating microscopes are favorable in the field of neurosurgery, ophthalmology, plastic surgery, and orthopedics. Theoretically, the high magnification and illumination can help in the most complex and difficult part of the ampulla operation, namely, dissection of the ampulla and reconstruction of the pancreatic and biliary duct. However, to date, there have been no publications in the English-language literature to demonstrate the potential advantages of the operating microscope in local resection of ampullary tumors.

We report the first case of transduodenal excision of an ampullary tumor with the assistance of an operating microscope. The optimal exposure and magnification with the microscope facilitated identification of the tumor margin; therefore, an adequate margin was obtained. Most importantly, the magnified ductal structures are easier to identify and reconstruct, thus optimal suturing can be achieved when performing choledochoduodenostomy and pancreaticoduodenostomy. In the present case, the patient had an uneventful postoperative recovery and was discharged. Compared to the existing data, the application of an operating microscope neither increased the operation time nor the complications. No signs of tumor recurrence and ductal stricture were found during the follow-up period. These results suggest that our proposal of using an operating microscope during transduodenal excision is advantageous in this group of patients. However, microsurgical applications also have limitations. For example, surgeons require precise technical skills and continuous training to complete the resection. The use of an operating microscope may increase the operation time and operation-associated contamination[32,33]. Thus, more cases are needed for analysis to demonstrate the potential benefits.

CONCLUSION

We demonstrated that transduodenal excision is an ideal approach for treating patients with benign ampullary tumors who are not amenable to EP. The use of an operating microscope provides significant technical advantages, particularly in dissecting and rebuilding the pancreaticobiliary ducts.

REFERENCES

- 1 **El Hajj II**, Coté GA. Endoscopic diagnosis and management of ampullary lesions. *Gastrointest Endosc Clin N Am* 2013; **23**: 95-109 [PMID: [23168121](#) DOI: [10.1016/j.giec.2012.10.004](#)]
- 2 **Seifert E**, Schulte F, Stolte M. Adenoma and carcinoma of the duodenum and papilla of Vater: a clinicopathologic study. *Am J Gastroenterol* 1992; **87**: 37-42 [PMID: [1728122](#)]
- 3 **De Palma GD**. Endoscopic papillectomy: indications, techniques, and results. *World J Gastroenterol* 2014; **20**: 1537-1543 [PMID: [24587629](#) DOI: [10.3748/wjg.v20.i6.1537](#)]
- 4 **Kang SH**, Kim KH, Kim TN, Jung MK, Cho CM, Cho KB, Han JM, Kim HG, Kim HS. Therapeutic outcomes of endoscopic papillectomy for ampullary neoplasms: retrospective analysis of a multicenter study. *BMC Gastroenterol* 2017; **17**: 69 [PMID: [28558658](#) DOI: [10.1186/s12876-017-0626-5](#)]
- 5 **Posner S**, Colletti L, Knol J, Mulholland M, Eckhauser F. Safety and long-term efficacy of transduodenal excision for tumors of the ampulla of Vater. *Surgery* 2000; **128**: 694-701 [PMID: [11015104](#) DOI: [10.1067/msy.2000.108218](#)]
- 6 **Nappo G**, Gentile D, Galvanin J, Capretti G, Ridolfi C, Petitti T, Spaggiari P, Carrara S, Gavazzi F, Repici A, Zerbi A. Trans-duodenal ampullectomy for ampullary neoplasms: early and long-term outcomes in 36 consecutive patients. *Surg Endosc* 2020; **34**: 4358-4368 [PMID: [31646438](#) DOI: [10.1007/s00464-019-07206-x](#)]
- 7 **Gao Y**, Zhu Y, Huang X, Wang H, Yuan Z. Transduodenal ampullectomy provides a less invasive technique to cure early ampullary cancer. *BMC Surg* 2016; **16**: 36 [PMID: [27251044](#) DOI: [10.1186/s12893-016-0156-z](#)]
- 8 **Uluç K**, Kujoth GC, Başkaya MK. Operating microscopes: past, present, and future. *Neurosurg Focus* 2009; **27**: E4 [PMID: [19722819](#) DOI: [10.3171/2009.6.FOCUS09120](#)]
- 9 **Damodaran O**, Lee J, Lee G. Microscope in modern spinal surgery: advantages, ergonomics and limitations. *ANZ J Surg* 2013; **83**: 211-214 [PMID: [23331506](#) DOI: [10.1111/ans.12044](#)]
- 10 **Espinell J**, Pinedo E, Ojeda V, Del Rio MG. Endoscopic management of adenomatous ampullary lesions. *World J Methodol* 2015; **5**: 127-135 [PMID: [26413485](#) DOI: [10.5662/wjmv5.i3.127](#)]

- 11 **Chini P**, Draganov PV. Diagnosis and management of ampullary adenoma: The expanding role of endoscopy. *World J Gastrointest Endosc* 2011; **3**: 241-247 [PMID: [22195233](#) DOI: [10.4253/wjge.v3.i12.241](#)]
- 12 **Fong ZV**, Ferrone CR, Thayer SP, Wargo JA, Sahora K, Seefeld KJ, Warshaw AL, Lillemoe KD, Hutter MM, Fernández-Del Castillo C. Understanding hospital readmissions after pancreaticoduodenectomy: can we prevent them? *J Gastrointest Surg* 2014; **18**: 137-44; discussion 144 [PMID: [24002770](#) DOI: [10.1007/s11605-013-2336-9](#)]
- 13 **Newhook TE**, LaPar DJ, Lindberg JM, Bauer TW, Adams RB, Zaydfudim VM. Morbidity and mortality of pancreaticoduodenectomy for benign and premalignant pancreatic neoplasms. *J Gastrointest Surg* 2015; **19**: 1072-1077 [PMID: [25801594](#) DOI: [10.1007/s11605-015-2799-y](#)]
- 14 **Kang JS**, Kim H, Kim JR, Han Y, Kim E, Byun Y, Choi YJ, Kwon W, Jang JY, Kim SW. Short- and long-term outcomes of pancreaticoduodenectomy in elderly patients with periampullary cancer. *Ann Surg Treat Res* 2020; **98**: 7-14 [PMID: [31909045](#) DOI: [10.4174/astr.2020.98.1.7](#)]
- 15 **Partelli S**, Tamburrino D, Cherif R, Muffatti F, Moggia E, Gaujoux S, Sauvanet A, Falconi M, Fusai G. Risk and Predictors of Postoperative Morbidity and Mortality After Pancreaticoduodenectomy for Pancreatic Neuroendocrine Neoplasms: A Comparative Study With Pancreatic Ductal Adenocarcinoma. *Pancreas* 2019; **48**: 504-509 [PMID: [30946244](#) DOI: [10.1097/MPA.0000000000001273](#)]
- 16 **Narayanan S**, Martin AN, Turrentine FE, Bauer TW, Adams RB, Zaydfudim VM. Mortality after pancreaticoduodenectomy: assessing early and late causes of patient death. *J Surg Res* 2018; **231**: 304-308 [PMID: [30278945](#) DOI: [10.1016/j.jss.2018.05.075](#)]
- 17 **Stevens CL**, Watters DAK. Short-term outcomes of pancreaticoduodenectomy in the state of Victoria: hospital resources are more important than volume. *ANZ J Surg* 2019; **89**: 1577-1581 [PMID: [31222880](#) DOI: [10.1111/ans.15298](#)]
- 18 **Torphy RJ**, Friedman C, Halpern A, Chapman BC, Ahrendt SS, McCarter MM, Edil BH, Schulick RD, Gleisner A. Comparing Short-term and Oncologic Outcomes of Minimally Invasive Versus Open Pancreaticoduodenectomy Across Low and High Volume Centers. *Ann Surg* 2019; **270**: 1147-1155 [PMID: [29771723](#) DOI: [10.1097/SLA.0000000000002810](#)]
- 19 **Yoshioka R**, Yasunaga H, Hasegawa K, Horiguchi H, Fushimi K, Aoki T, Sakamoto Y, Sugawara Y, Kokudo N. Impact of hospital volume on hospital mortality, length of stay and total costs after pancreaticoduodenectomy. *Br J Surg* 2014; **101**: 523-529 [PMID: [24615349](#) DOI: [10.1002/bjs.9420](#)]
- 20 **Mathur A**, Paul H, Ross S, Luberic K, Hernandez J, Vice M, Rosemurgy AS. Transduodenal ampullectomy for ampullary adenomas: a safe and effective procedure with long-term salutary outcomes. *Am Surg* 2014; **80**: 185-190 [PMID: [24480221](#)]
- 21 **Hong S**, Song KB, Lee YJ, Park KM, Kim SC, Hwang DW, Lee JH, Shin SH, Kwon J, Ma CH, Hwang S, Park G, Park Y, Lee SJ, Kim YW. Transduodenal ampullectomy for ampullary tumors - single center experience of consecutive 26 patients. *Ann Surg Treat Res* 2018; **95**: 22-28 [PMID: [29963536](#) DOI: [10.4174/astr.2018.95.1.22](#)]
- 22 **Schneider L**, Contin P, Fritz S, Strobel O, Büchler MW, Hackert T. Surgical ampullectomy: an underestimated operation in the era of endoscopy. *HPB (Oxford)* 2016; **18**: 65-71 [PMID: [26776853](#) DOI: [10.1016/j.hpb.2015.07.004](#)]
- 23 **Jung MK**, Cho CM, Park SY, Jeon SW, Tak WY, Kweon YO, Kim SK, Choi YH. Endoscopic resection of ampullary neoplasms: a single-center experience. *Surg Endosc* 2009; **23**: 2568-2574 [PMID: [19360365](#) DOI: [10.1007/s00464-009-0464-9](#)]
- 24 **Jeanniard-Malet O**, Caillol F, Pesenti C, Bories E, Monges G, Giovannini M. Short-term results of 42 endoscopic ampullectomies: a single-center experience. *Scand J Gastroenterol* 2011; **46**: 1014-1019 [PMID: [21492053](#) DOI: [10.3109/00365521.2011.571711](#)]
- 25 **Ceppa EP**, Burbridge RA, Rialon KL, Omotosho PA, Emick D, Jowell PS, Branch MS, Pappas TN. Endoscopic vs surgical ampullectomy: an algorithm to treat disease of the ampulla of Vater. *Ann Surg* 2013; **257**: 315-322 [PMID: [23059497](#) DOI: [10.1097/SLA.0b013e318269d010](#)]
- 26 **Lee JW**, Choi SH, Chon HJ, Kim DJ, Kim G, Kwon CI, Ko KH. Robotic transduodenal ampullectomy: A novel minimally invasive approach for ampullary neoplasms. *Int J Med Robot* 2019; **15**: e1979 [PMID: [30578741](#) DOI: [10.1002/rcs.1979](#)]
- 27 **Grobmyer SR**, Stasik CN, Draganov P, Hemming AW, Dixon LR, Vogel SB, Hochwald SN. Contemporary results with ampullectomy for 29 "benign" neoplasms of the ampulla. *J Am Coll Surg* 2008; **206**: 466-471 [PMID: [18308217](#) DOI: [10.1016/j.jamcollsurg.2007.09.005](#)]
- 28 **Rosen M**, Zuccaro G, Brody F. Laparoscopic resection of a periampullary villous adenoma. *Surg Endosc* 2003; **17**: 1322-1323 [PMID: [12799897](#) DOI: [10.1007/s00464-002-4527-4](#)]
- 29 **Ahn KS**, Han HS, Yoon YS, Cho JY, Khalikulov K. Laparoscopic transduodenal ampullectomy for benign ampullary tumors. *J Laparoendosc Adv Surg Tech A* 2010; **20**: 59-63 [PMID: [19792863](#) DOI: [10.1089/lap.2009.0243](#)]
- 30 **Zhang RC**, Xu XW, Wu D, Zhou YC, Ajoodhe H, Chen K, Mou YP. Laparoscopic transduodenal local resection of periampullary neuroendocrine tumor: a case report. *World J Gastroenterol* 2013; **19**: 6693-6698 [PMID: [24151401](#) DOI: [10.3748/wjg.v19.i39.6693](#)]
- 31 **Wong FCH**, Lai ECH, Chung DTM, Tang CN. Robotic transduodenal excision of ampullary tumour. *Hepatobiliary Surg Nutr* 2017; **6**: 312-316 [PMID: [29152477](#) DOI: [10.21037/hbsn.2016.12.04](#)]
- 32 **Weiner BK**, Kilgore WB. Bacterial shedding in common spine surgical procedures: headlamp/Loupes and the operative microscope. *Spine (Phila Pa 1976)* 2007; **32**: 918-920 [PMID: [17426639](#) DOI: [10.1097/01.brs.0000259837.54411.60](#)]

- 33 **Bible JE**, O'Neill KR, Crosby CG, Schoenecker JG, McGirt MJ, Devin CJ. Microscope sterility during spine surgery. *Spine (Phila Pa 1976)* 2012; **37**: 623-627 [PMID: [21681131](#) DOI: [10.1097/BRS.0b013e3182286129](#)]



Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

Telephone: +1-925-3991568

E-mail: bpgoffice@wjgnet.com

Help Desk: <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

