Session 3. This is the Way to Deal with Adenoma of Ampulla of Vater

Transduodenal ampullectomy is enough for AoV adenoma

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Curriculum Vitae

2000-2003	Ph.D. (Medical Science), Hanyang University, Seoul, Korea
1984-1987	Premedicine, Hanyang University, Seoul, Korea
1987-1991	M.D., College of Medicine, Hanyang University, Seoul, Korea
1999-2000	M.S. (Medical Science), Hanyang University, Seoul, Korea
1991-1992	Intern, Hanyang University Hospital, Seoul, Korea
1996-2000	Resident, Department of General Surgery, Hanyang University Hospital, Seoul, Korea
1998-1999	Public Health Care Doctor, Public Health Care Hospital, YangPyoung-Gun, Gyunggi Province, Korea
2000-2002	Clinical fellow, Department of Surgery, College of Medicine, Hanyang University Hospital
2005-2007	Clinical Observer, Department of Surgery, College of Medicine, Drexel University, Philadelphia, PA, USA
2003-Present	Professor, Department of Surgery, College of Medicine, Hanyang University

Transduodenal Ampullectomy is enough for ampullary adenoma

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Current Issue for TDA

1. Technical aspect of performing TDA
2. Personal experience for TDA(20 cases)
3. Consensus for indication of TDA
4. Analysis for Pathologic finding(endo/frozen/final)
5. Current status of TDA
6. Need mass study for operation of early ampullary cancer.
   (Tis, T1 with LN(-)/LN(+))

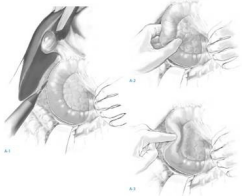
Introduction

1. Local excision of ampullary neoplasm was first described by Halted in 1899.
   => failed to achieve wide-spread acceptance because of the high rate of tumor recurrence.
2. PD was introduced by Whipple et al in 1935.
3. Many centers have developed expertise in PD for peripancreatic tumors.
   => In experience centers, PD is associated with low mortality rate, but high rate of perioperative morbidity.
4. TDA is potentially an alternative procedure in appropriate patients because of low morbidity and simple procedure.

TDA

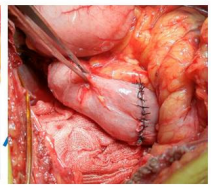
1. After mobilization of hepatic flexture inferiorly, a wide Kocher maneuver is performed mobilizing the duodenum.
   => make good operative field
   & can reduce tension for duodenostomy

Operator should inspect peri-pancreatic L/N for frozen biopsy before duodenodtomy.



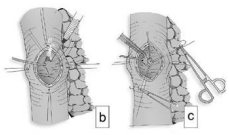
TDA

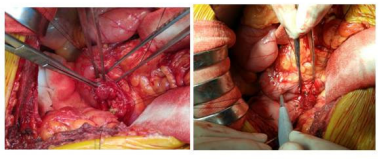
2. Duodenostmy
   1) Longitudinal incision(4-5cm) => transverse closure of duodenostomy
   2) Transverse incision(half circle) => transverse closure
      => Interrupted double layer suture can prevent duodenal stenosis.



TDA

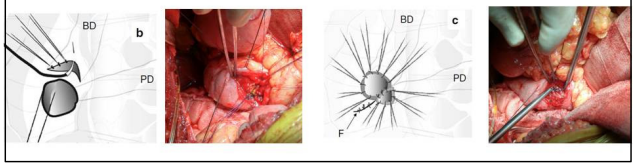
3. Local excision of ampulla
   1) Careful identification of pancreatic and bile duct
   2) Performed traction suture on ampulla mass and duodenum
   3) 'Needle-point' electrocuatery with cutting mode is used to excise the mass, because clear surgical margin is needed for frozen biopsy.
   4) Both duct were marked with stay suture before completion of the excision
   5) Frozen section was performed to exclude a malignant lesion and to ensure complete excision





TDA

4. Reconstruction of bile and pancreatic duct
   1) Once the lumen of the CBD is entered, the bile duct is sutured to the duodenal wall with PDS 5-0, it will prevent retraction of the CBD.
   2) Confirmed ostium of bile and pancreatic duct before suture (pancreatic duct : 2 o'clock position, bile duct : 11 o'clock position)
   3) The sequential sutures was performed to CBD and pancreatic duct to the duodenal wall by circular single sutures(duct to mucosa)
   4) If surgical margin was presented by malignant cell, operator must convert to PD because secondary resection is very difficult and dangerous for surgical margin.



Personal results with TDA for 20 cases

1. Retorspectively reviewed my experience with TDA in 20 patients with final histologic diagnosis over 12 years(2004 – 2016)
2. Benign ampullary tumors(11 patients)
   1) tubular adenoma : 7 cases
   2) tubovillous adenoma : 3 cases
   3) villous adenoma : 0 case
   4) chronic inflammation : 1 case
3. Malignant ampullary tumors(9 patients)
   1) adenocarcinoma : 8 patients
   2) neuroendocrine carcinoma : 1 case

Benign ampullary tumors (11 patients)

case	sex	Age	symptom	op	op-time(m)	HD	complication	Size (cm)	final DX	Dysplasia	margin	F/U	recurrence	outcome
1	F	83	abd pain	TDA	140	9	none	1.5	tubovillous adenoma	focal high grade	(-)	16mo	no	live
2	M	58	check up	TDA	185	10	none	1	tubovillous adenoma	focal high grade	?	68mo	no	live
3	M	61	check up	TDA	360	17	pancreatitis	0.5	tubular adenoma	high grade	?	23mo	no	?
4	F	62	epigastric pain	TDA	295	14	none	2.5	tubovillous adenoma	low grade	(-)	41mo	no	live
5	M	54	epigastric pain	TDA	155	11	none	1.5	tubular adenoma	low grade	Tubular adenoma(+)	69mo	no	live
6	M	61	check up	TDA	115	9	none	1.6	atypical gland		(-)	26mo	no	live
7	M	75	check up	TDA	135	9	pancreatitis	1.7	tubular adenoma	low grade	(-)	46mo	no	live
8	M	63	check up	TDA	240	19	none	0.4	tubular adenoma	low grade	(-)	24mo	?	?
9	M	34	epigastric pain	TDA	150	11	none	1	tubular adenoma	high grade	(-)	149mo	no	live
10	M	60	abd pain	TDA	190	8	none	1	chronic inflammation			?	?	?
11	M	80	check up	TDA	135	10	bleeding	2	tubular adenoma	high grade	(-)	35mo	? (intrahepatic-CCC)	live

Mean age : 63yrs, M:F=2:9
HD : 11ds, tumor size : 1.3cm, op-time : 190m

Malignant ampullary tumors (9 patients)

case	age/sex	symptom	op	case	HD	complication	size	final DX	T-stage	Grade	margin	F/U period	recurrence	outcome
1	M/67	check up	TDA	220m	11	none	2.5cm	adeno-ca	T1	well	(-)	19mo=> loss	no at 19mo	?
2	M/46	check up	TDA	180m	11	none	3.5cm	adeno-ca	Tis	well	villous adenoma(+)	56mo	no	live
3	M/75	check up	TDA	165M	11	none	1.7cm	adeno-ca	T1	mod	(-)	25mo	klatskin tumor(2015/12)	died
4	F/58	check up	TDA	170m	12	none	2.3cm	adeno-ca	Tis	well	adenomatous component(+)	133mo	no	live
5	F/82	check up	TDA	165m	7	none	2.0cm	adeno-ca	T1	mod	(-)	16mo	no	live
6	F/61	check up	TDA	130m	8	pancreatitis	2.0cm	adeno-ca	Tis	well	tubular adenoma(+)	33mo	no	live
7	M/62	check up	TDA	125m	9	none	2.5cm	adeno-ca	T1	mod	(-)	5mo	no	live
8	F/77	epigastric pain	PPPD	410m		none	1.0cm	adeno-ca	T1	mod	(-)	16mo	no	live
9	M/56	check up	PPPD	420m		none	3cm	neuroendo-ca	T3N1M0	poor	(-)	22mo	yes	live

Mean age : 64yrs, M:F=5:4
HD : 9.9ds(for TDA), tumor size : 2.2cm, op-time : 165m(for TDA)

Endo vs Frozen vs Final diagnosis

case	endo-dx	frozen-dx	final dx
1	tubovillous adenoma	tubular adenoma	adenocarcinoma, pT1
2	tubovillous adenoma	villous adenoma	tubovillous adenoma
3	tubovillous adenoma	villous adenoma	tubovillous adenoma
4	chronic inflammation	chronic inflammation	tubovillous adenoma
5	tubular adenoma	tubular adenoma	tubovillous adenoma
6	tubovillous adenoma	tubular adenoma	adenocarcinoma, pTis
7	adenomatous polyps	adenomatous polyps	tubular adenoma
8	chronic inflammation	adenocarcinoma	adenocarcinoma, pT1
9	tubular adenoma	tubular adenoma	atypical glandular lesion
10	tubular adenoma	tubular adenoma	tubular adenoma
11	tubovillous adenoma	tubovillous adenoma	adenocacinoma, pTis
12	villous adenoma	tubovillous adenoma	adenocarcinoma, pT1
13	tubular adenoma	tubular adenoma	tubular adenoma
14	villous adenoma	adenocarcinoma	adenocarcinoma, pTis
15	tubular adenoma	tubular adenoma	tubular adenoma
16	tubulovillous adenoma	chronic inflammation	chronic inflammation
17	not check	adenocarcinoma	adenocarcinoma, pT1
18	tubulovillous adenoma	tubular adenoma	tubovillous sdenoma
19	adenocarcinoma	adenocarcinoma	adenocarcinoma, pT1
20	neuroendocrine carcinoma	neuroendocrine carcinoma	neuroendocrine carcinoma(G4)

The diagnostic accuracy
endo : 11/20(55%)
2/9(22%) for cancer
frozen : 16/20(80%)
5/9(56%) for cancer

pT1 without LN invasion : 4/7
pTis without LN invasion : 3/7

PPPD : 2 cases(case No 19 /20)

Contemporary Results with Ampullectomy for 29 "Benign" Neoplasms of the Ampulla

Stephen R Grobmyer, MD, Chad N Stasik, MD, Peter Draganov, MD, Alan W Hemming, MD, FACS, Lisa R Dixon, MD, Stephen B Vogel, MD, FACS, Steven N Hochwald, MD, FACS

Study design : Retrospectively reviewed ampullectomy in 29 patients with a preoperative benign histologic diagnosis over 15 years (1991 to 2006)
Results : 1) Preoperative biopsy had exact concordance with final diagnosis in 22 of 29 specimens(76%)
2) Frozen section had concordance with final histologic diagnosis in 15 of 17 patients(88%)

CONCLUSIONS: Preoperative biopsy and intraoperative frozen section analysis have limitations in the management of patients undergoing ampullectomy. High-grade dysplasia on preoperative biopsy is not an absolute contraindication to ampullectomy. Morbidity of ampullectomy is significant, but longterm outcomes of this procedure, in patients without invasive malignancy, are acceptable.
(J Am Coll Surg 2008;206:466–471. © 2008 by the American College of Surgeons)

http://dx.doi.org/10.1016/j.hpb.2015.07.004 HPB

ORIGINAL ARTICLE

Surgical ampullectomy: an underestimated operation in the era of endoscopy

Lutz Schneider, Pietro Contin, Stefan Fritz, Oliver Strobel, Markus W. Büchler & Thilo Hackert

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Results: Eighty-three patients underwent TSA. Indications included adenomas in 44 and inflammatory stenosis in 39 patients. 96% of the patients had undergone endoscopic therapeutic approaches prior to TSA (median no. of interventions n = 3). Postoperative morbidity occurred in 20 patients (24%). There was one procedure-associated death (mortality 1.2%). The mean follow-up was 54 months. Long-term overall success rate for TSA was 83.6%. After TSA for ampullary adenoma, the recurrence rate was 4.5%.

Conclusion: TSA is an underestimated surgical procedure, which can be performed safely with high long-term efficacy. It can be implemented in clinical algorithms for patients with benign pathologies of the ampulla of Vater, particularly after unsuccessful endoscopic treatment.

Gao et al. BMC Surgery (2016) 16:36
DOI 10.1186/s12893-016-0156-z

BMC Surgery

RESEARCH ARTICLE Open Access

Transduodenal ampullectomy provides a less invasive technique to cure early ampullary cancer

Yang Gao, Yayun Zhu, Xiuyan Huang, Hongcheng Wang, Xinyu Huang and Zhou Yuan*

Methods : We carried out a retrospective study by reviewing the medical records of 43 patients with early ampullary cancer who underwent either TDA or PD from January 2001 to December 2014. (TDA : PD = 22 : 21)

Results: The sensitivity of intraoperative frozen resection was 100 % (4/4) and 94.9 % (37/39) in patients with pTis and pT1 tumors compared to final histologic diagnoses. The 5-year survival rate of patients with early ampullary cancer was 77.3 % in TDA group and 75.9 % in PD group ($P = 0.927$). Patients with lymph node metastasis presented a shorter 5-year survival rate ($P = 0.014$). TDA was associated with lower surgical morbidity ($P = 0.033$), estimated blood loss ($P = 0.002$), medical cost ($P = 0.028$) compared to PD. No pancreatic fistula and surgical mortality occurred in TDA group.

Conclusions: TDA could produce satisfactory clinical efficiency in patients fulfilled the following criteria simultaneously: pTis or pT1 stage, tumor size ≤ 2 cm, without lymph node metastasis. To achieve favorable outcomes, intraoperative frozen section examinations should be reliable and resection margins should be negative.

Song et al. BMC Surgery (2015) 15:32
DOI 10.1186/s12893-015-0019-z

BMC Surgery

RESEARCH ARTICLE Open Access

Long-term prognosis of surgical treatment for early ampullary cancers and implications for local ampullectomy

Junmin Song[1*], Hongxiang Liu[1], Zhen Li[1], Chao Yang[1], Yuling Sun[1] and Chaojie Wang[2]

Methods : 89 patients with pT1 ampullary cancer who underwent surgical treatment between 1978 and 2010 were retrospectively studied. (Local ampullectomy : PD = 26 : 63)

Results: Rate of postoperative complications, especially post-operative pancreatic fistula ($P = 0.009$), after PD was higher than after local ampullectomy, . Multivariate analysis showed that tumor size (HR 2.204; $P = 0.014$), lymph node metastasis (HR 4.362; $P < 0.001$), lymph vascular invasion (HR 4.258; $P < 0.001$), and perineural invasion (HR 4.467; $P < 0.001$), gross morphology (HR 2.536; $P = 0.004$) and tumor grade (HR 4.213; $P = 0.001$) were independent risk factors for long-term survival, as well as risk factors for failure of ampullectomy in early ampullary cancer. For patients absent of these factors, local ampullectomy would achieve a good prognosis.

Conclusions: Because of high rate of lymph node metastasis, PD should be preferably performed for radical resection. Local ampullectomy could be an alternative for patients in high operative risk; and would achieve a good outcome in patients whose tumors were well differentiated and showed polypoid gross morphology and size ≤1 cm.

World J Surg (2016) 40:967–973
DOI 10.1007/s00268-015-3316-x

World Journal of Surgery

CrossMark

ORIGINAL SCIENTIFIC REPORT

Transduodenal Ampullectomy for the Treatment of Early-Stage Ampulla of Vater Cancer

Huisong Lee[1] · Jin Young Park[1] · Wooil Kwon[1] · Jin Seok Heo[1] · Dong Wook Choi[1] · Seong Ho Choi[1]

Results

Total 137 patients were included in this study. The 18 patients underwent TDA and 119 patients underwent PD for Tis or T1 ampullary cancer. There was no lymph node metastasis in the patients with Tis tumor although 10 of 104 patients had lymph node metastasis in T1 cancer. After a median follow-up of 50 months (range, 6–148), there were no recurrence after TDA for Tis tumor. However, the TDA was associated with higher local recurrence rate than PD in the patients with T1 ampullary cancer on Kaplan–Meier survival analysis ($p = 0.007$).

Conclusion

The TDA is feasible treatment for Tis ampulla of Vater neoplasm. However, TDA is unsuitable for the treatment of T1 ampulla of Vater cancer.

DOI:10.1111/hpb.12297 HPB

ORIGINAL ARTICLE

Is local resection adequate for T1 stage ampullary cancer?

Albert Amini, John T. Miura, Thejus T. Jayakrishnan, Fabian M. Johnston, Susan Tsai, Kathleen K. Christians, T. Clark Gamblin & Kiran K. Turaga

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Methods: All the data of patients with AC reported in the Surveillance, Epidemiology and End Results (SEER) database between 2004 and 2010 were collected. Five-year survival rates according to nodal disease and histological type were compared.

Results: There were 1916 cases of AC; 421 (22%) had T1 disease. Among those with T1 disease, 217 (51%) received endoscopic surveillance, 21 (5%) underwent local resection/ampullectomy, 20 (5%) underwent ampullectomy with regional lymphadenectomy and 163 (39%) underwent PD. For patients with complete nodal staging (PD, $n = 163$), 35 (22%) had metastatic disease in the nodes. Grade was significantly associated with node positivity ($P = 0.007$). In multivariate models, survival was improved with either an ampullectomy with regional lymphadenectomy [hazard ratio (HR) 0.19; 95% confidence interval (CI) 0.05–0.61, $P < 0.005$] or a PD (HR 0.23; 95% CI 0.15–0.36, $P < 0.001$).

Conclusion: Patients with T1 AC have a high risk for nodal metastases especially if they are higher-grade lesions. Nodal clearance with a lymphadenectomy or a PD is essential for long-term survival in these patients.

Grade vs LN meta (pT1)
1) 10% in well diff
2) 12% in mod
3) 27% poor diff

Lymphnode metastasis in early ampullary cancer(pT1)

Is local excision of pT1-ampullary carcinomas justified?

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*Department of Surgery, Friedrich-Alexander University, Erlangen-Nürnberg, and †Division of Clinical Pathology, Department of Surgery, Friedrich-Alexander-University, Erlangen-Nürnberg, Germany

We propose that local excision of carcinomas of the ampulla of Vater is justifiable under the following conditions: when the tumour is limited to the ampulla of Vater as diagnosed by pre-operative endoluminal sonography (uT1) and UICC-staging (pT1); and when it is graded G1 or G2 and there is no lymphatic infiltration and the tumour is completely resected (R0). Under these conditions peri-operative morbidity and mortality were significantly reduced compared with more extensive surgery. There was no local recurrence of tumour in our study and long-term survival rates were comparable with Whipple's procedure. This implies that lymphatic spread is limited in localized disease and the feasibility of the proposed procedure may therefore be analogous to localized resections in other malignant tumours, e.g. carcinoma of the rectum.

Key words: carcinoma; ampulla of Vater; excision; pancreatoduodenectomy.

European Journal of Surgical Oncology 1996; 22: 366–371

Regional Lymphatic spread is 4.2% in grade G1 and G2.
=> Limitation of this article is relatively small volume study.

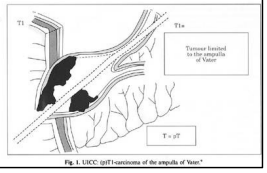

Fig. 1. UICC: (pT1-carcinoma of the ampulla of Vater.)

(*Ann Surg* 2005;242: 92–100)

Clinicopathologic Analysis of Early Ampullary Cancers With a Focus on the Feasibility of Ampullectomy

Yoo-Seok Yoon, MD, Sun-Whe Kim, MD,* Sang Jae Park, MD,* Hye Seung Lee, MD,† Jin-Young Jang, MD,* Min Gew Choi, MD,* Woo Ho Kim, MD,† Kuhn-Uk Lee, MD,* and Yong-Hyun Park, MD**

Methods: Of 201 patients who had undergone PD for ampullary cancer between 1986 and 2002, 67 patients with a histologic diagnosis of pTis (n = 5) or pT1 (n = 62) cancer were analyzed retrospectively. Pathologic PD specimens were reviewed to analyze the cancer spread pattern, and medical records were reviewed for clinical outcomes.

Conclusions: Ampullectomy for early ampullary cancer should not be considered an alternative operation to PD because of the high possibility of recurrence. PD should be preferably performed for adequate radical resection, even in early ampullary cancer, and ampullectomy should be reserved for those who have pTis or pT1 cancer sized 1.0 cm or less with high operative risk.

TABLE 5. Risk Factors for Failure After Ampullectomy in Early Ampullary Cancer

Risk Factor	No. (%) of Patients
Lymph node metastasis	6 (9.0)
Perineural invasion	1 (1.5)
Lymphovascular invasion	—
CBD or P-duct mucosal involvement*	15 (22.4)
At least one factor	22 (32.8)

*CBD mucosal involvement, 14 cases; P-duct mucosal involvement, 4 cases.

Today's message for early ampullary tumor

1. TDA is generally safe and acceptable procedure for benign small tumors.
   (tubular, villous, tubovillous adenoma)
2. PD is still the standard procedure for ampullary cancer.
3. TDA may be considered alternative operation in highly selective patients with early ampullary cancer
4. Frozen biopsy has very critical role to determine surgical extension for early ampullary tumors.

Today's message for ampullary tumor

5. Possible indication of TDA in early ampullary cancer
   1) Size < 1-2cm
   2) Depth of tumors(Tis & pT1)
      Without lymph node metastasis,
      Well differentiated tumor(G1, G2)
   3) High operative risk for PD

   => TDA with regional lymphadenectomy in selective patients?

6. Need further mass study for consensus of TDA indication for early ampullary cancer(Tis & pT1)