Journal of BUON **13:** 569-572, 2008

A prospective comparison of ampullectomy with pancreaticoduodenectomy for the treatment of periampullary cancer

E.E. Lagoudianakis[1], D. Tsekouras[1], N. Koronakis[2], J. Chrysicos[2], F. Archontovasilis[1], K. Filis[1], V. Katergiannakis[1], A. Manouras[1]

[1]First Department of Propaedeutic Surgery, "Hippocrateion" Hospital, Athens Medical School, Athens; [2]Second Department of Surgery, 417 NIMTS Hospital, Athens, Greece

Summary

Local surgical treatment of periampullary neoplasms seems attractive in the context of the reduced morbidity and mortality than the more radical treatment options. The aim of our study was to compare local excision (LE) of the ampulla with standard pancreaticoduodenectomy (PD) for the treatment of periampullary cancer in terms of overall survival.

Inclusion criteria were primary tumor ≤ 2 cm with no evidence of lymph node involvement or distant metastasis on abdominal computed tomography (CT). Between January 2000 and January 2004, 23 patients were enrolled onto this study (9 in the LE group and 14 in the standard PD group). The two groups were homogeneous with respect to age and gender as well as the size and origin of the primary neoplasm. There was no correlation of the survival with age, gender, presence of lymph node metastasis, size of the primary tumor, type of surgery or histologic grade (x^2, $p > 0.05$). However, the origin of the tumor had major impact on survival, with pancreatic tumors having the worst prognosis. Hospital stay was significantly reduced in the LE treated patients. Our results showed that LE for periampullary tumors is a viable option and is well suited for medically unfit patients or those who refuse more radical treatment options.

Key words: ampullectomy, local excision of the ampulla, pancreaticoduodenectomy, periampullary neoplasms

Introduction

Periampullary carcinomas include tumors originating from the pancreas, the common bile duct, the mucosa of the ampulla of Vater and the mucosa of the duodenum. Halsted was the first to perform local excision of the ampulla for the treatment of periampullary cancer in 1899 [1]. Local treatment of the periampullary neoplasms seems very attractive in relation to morbidity and mortality compared to more radical treatment options (PD or the pylorus-preserving PD) [2-4].

Although ampullectomy or excision of the papilla have been proposed as alternative to PD for the treatment of benign neoplasms of the region of the ampulla, the gold standard for the treatment of periampullary carcinomas remains PD [5,6].

The aim of our study was to compare LE of the ampulla with the standard PD for the treatment of periampullary cancer in terms of overall survival.

Patients and methods

The Ethical Committee of our hospital approved the current study. Between January 2000 and January 2004, 149 patients with diagnosed periampullary cancer were prospectively evaluated for inclusion onto study. Inclusion criteria were primary tumor of ≤ 2 cm with no evidence of lymph node involvement or distant metastasis on abdominal CT. Finally, 23 patients were enrolled. The patients were informed about the study protocol and signed an informed consent. All patients medically unfit

Correspondence to: Emmanuel Lagoudianakis, MD. Agamemnonos 17, 174 56 Athens, Greece. Tel: +30 6948 529440, Fax: +30 210 7707574, E-mail: redemlag@yahoo.gr

Received 15-05-2008; Accepted 24-06-2008

for PD were included in the LE group as well as those who refused to undergo PD or chose LE. In all cases the LE technique included ampullectomy with reinsertion of the common bile and pancreatic duct to the duodenum, with the aim to include resection of all gross tumor with 1 cm macroscopically free margin. Frozen sections were performed in all cases to examine the margins of the excised specimen and the depth of infiltration of the primary tumor. PD was performed in any case with positive margins. PD was performed in the remaining patients.

Results

Frozen sections documented positive margins in 6 patients. Completion PD was performed in all these cases. Finally, the LE group included 9 patients and the PD group 14 patients.

The two groups were homogeneous since no significant differences were noted between them with respect to age, gender and origin of the primary neoplasm. There were 6 women in the PD group and 4 in the LE group. The mean age of PD patients was 67.2 years (SD ± 5.32) while in the LE patients it was 63.66 years (SD ± 5.18) (t-test, p=0.6). The size of the primary tumor was 1.68 cm (SD ± 0.4) in the PD group and 1.7 cm (SD ± 0.33) in the LE group (t-test, p=0.57; Table 1).

The final histological determination of the origin of the neoplasms for each group is shown in Table 1.

Lymph node metastasis was documented in 7 (50%) patients treated with PD (Table 1). However, there were no differences in the presence of lymph node metastasis regarding the origin of the tumor, the size of the primary lesion or the depth of tumor infiltration (x^2, $p > 0.05$).

The PD patients were hospitalized for a mean of 21.7 days (SD ± 9.1) while the LE patients required a mean of 14.4 days (SD ± 3.3) hospital stay (t-test, p=0.007).

There were one perioperative death and one major complication (dehiscence of the choledochojejunal anastomosis) in the PD group. There were no major complications or death in the LE group.

The survival of the two groups was similar. There

Table 1. Demographic, clinical characteristics and outcome of our patients

Patient no.	*Gender*	*Tumor origin*	*Treatment*	*Age (years)*	*Size (cm)*	*Hospital stay (days)*	*Survival (months)*	*Lymph node metastasis*
1	F	Vater	PD	74	2.00	29	36	+
2	M	Vater	PD	66	1.00	16	40	+
3	F	Pancreas	PD	78	1.20	18	18	–
4	M	Pancreas	PD	62	1.00	14	26	–
5	M	Pancreas	PD	65	2.00	20	24	–
6	M	Vater	PD	66	1.80	14	11	+
7	F	Vater	PD	64	2.00	19	4	+
8	F	Vater	PD	77	2.00	18	58	–
9	M	Vater	PD	68	1.60	20	64	+
10	M	Pancreas	PD	70	2.00	50	2	+
11	M	Common bile duct	PD	48	1.80	23	68	–
12	F	Common bile duct	PD	74	1.20	26	48	–
13	M	Pancreas	PD	65	2.00	21	3	+
14	F	Vater	PD	65	2.00	16	72	–
15	F	Pancreas	Ampullectomy	63	2.00	12	31	–
16	M	Common bile duct	Ampullectomy	59	1.80	14	64	–
17	F	Vater	Ampullectomy	72	2.00	11	44	–
18	F	Common bile duct	Ampullectomy	68	2.00	16	42	–
19	M	Vater	Ampullectomy	57	1.30	14	41	–
20	M	Pancreas	Ampullectomy	54	2.00	12	21	–
21	M	Common bile duct	Ampullectomy	71	1.40	18	42	–
22	F	Vater	Ampullectomy	67	1.60	21	54	–
23	M	Common bile duct	Ampullectomy	62	1.20	12	60	–

F: female, M: male, PD: pancreaticoduodenectomy

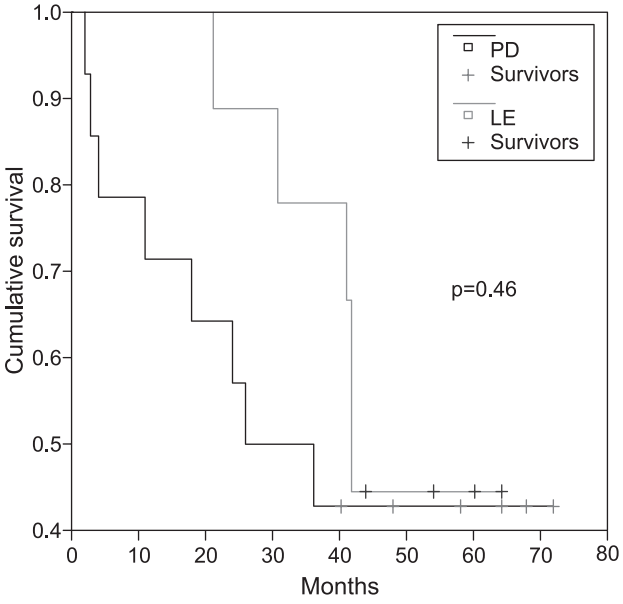

Figure 1. Kaplan-Meier survival curve of the patients stratified by the surgical treatment (pancreaticoduodenectomy/PD and local excision/LE) shows no statistically significant difference between the two groups.

were 4 5-year survivors in the LE group and 6 in the PD group (Figure 1).

However, the origin of the tumor from the pancreas was a uniformly grave prognostic factor with no patient surviving 5 years in both groups (Figure 2).

Discussion

Ampullary resection for cancer has been reported in the literature for the treatment of adenoma or pT1 malignant lesions of the ampulla. We decided to perform ampullectomy with full-thickness excision of the duodenal wall and reinsertion of the main pancreatic duct and common bile duct to the duodenum instead of limited excision of the papilla in an attempt to achieve clear margins. The unavailability of endoscopic ultrasound determination of the depth of tumor invasion in our department also made the ampullectomy more appropriate technique for the accurate pathological determination of the margin status. In our series, 6 patients required completion PD for positive margins of resection.

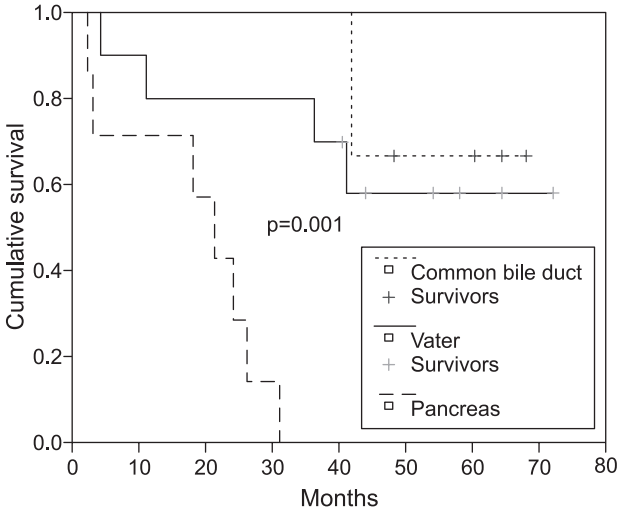

Figure 2. Kaplan-Meier survival curve of the patients stratified by the tumor origin. The outcome was significantly worse in patients with pancreatic cancer (p=0.001).

We found that lymph node metastasis was present in 50% of the PD-treated patients. However, no correlations were found between the likelihood of lymph node dissemination and the depth of tumor infiltration, tumor grade and histological determination of the origin of the lesion, and more importantly the prognosis of these patients (x^2, $p > 0.05$).

Lymph node metastasis represents a significant obstacle of the local excision techniques and further investigation of our findings is warranted.

Our study showed that prognosis is unaffected by the kind of the surgical technique performed. The mean survival of the LE-treated patients was 48.1 months and 39.7 months in the PD group (log-rank, p=0.46). Furthermore, there was no correlation of the survival with age, gender, presence of lymph node metastasis, size of the primary tumor, type of surgery or histological grade (x^2, $p > 0.05$). However, the origin of the tumor had major impact on survival with tumor originating from the pancreas having the worst prognosis (Figure 2).

Hospital stay was significantly reduced in the LE-treated patients. Our results are in agreement with the results of other authors [7,8]. There were no major complications or death in the LE group in contrast with a perioperative death and a major event in the PD group requiring reoperation. However, the difference was of no statistical significance.

In conclusion, our results showed that LE of periampullary tumors is a viable option. Adherence to the established criteria of size ≤ 2 cm, clear resection margins and absence of lymphadenopathy [7,9] provide similar results to standard PD in medically unfit patients or those who refuse more radical treatment options.

References

1. Halsted WS. Contributions to surgery of the bile passages, especially of the common bile duct. Boston Med Surg J 1899; 141: 645-654.
2. Klein P, Reingruber B, Kastl S, Dworak O, Hohenberger W. Is local excision of pT1-ampullary carcinomas justified? Eur J Surg Oncol 1996; 22: 366-371.

3. Sharp KW, Brandes JL. Local resection of tumors of the ampulla of Vater. Am Surg 1990; 56: 214-217.
4. Isaksson G, Ihse I, Andrén-Sandberg A, Evander A, Löfgren B, Millbourn E. Local excision for ampullary carcinoma. An alternative treatment for patients unfit for pancreatectomy. Acta Chir Scand 1982; 148: 163-165.
5. Kobayashi A, Konishi M, Nakagohri T, Takahashi S, Kinoshita T. Therapeutic approach to tumors of the ampulla of Vater. Am J Surg 2006; 192: 161-164.
6. Branum GD, Pappas TN, Meyers WC. The management of tumors of the ampulla of Vater by local resection. Ann Surg 1996; 224: 621-627.
7. Rattner DW, Fernandez-del Castillo C, Brugge WR, Warshaw AL. Defining the criteria for local resection of ampullary neoplasms. Arch Surg 1996; 131: 366-371.
8. Clary BM, Tyler DS, Dematos P, Gottfried M, Pappas TN. Local ampullary resection with careful intraoperative frozen section evaluation for presumed benign ampullary neoplasms. Surgery 2000; 127: 628-633.
9. Demetriades H, Zacharakis E, Kirou I et al. Local excision as a treatment for tumors of ampulla of Vater. World J Surg Oncol 2006; 4: 14.