



Fast Track Anesthesia and Outcomes in Hepatopancreatobiliary Cancer Surgery: A Retrospective Analysis

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Abstract

Aim: To assess the feasibility of a fast-track anesthesia protocol for hepatopancreatobiliary cancer surgery.

Methods: Retrospective analysis of consecutive sample of patients who underwent hepatopancreatobiliary surgery for cancer for a period of 12 months in a high volume cancer center. Blended-anesthesia was performed for most patients who were then observed in a recovery room area until achieving a safety score.

Results: Data of 163 patients were examined. Fifty-six and 107 patients underwent surgery for pancreatic cancer and liver surgery for primary tumor or metastases, respectively. Most patients were ASA 3. The mean durations of anesthesia and surgery were 322 min (SD 320) and 296 min (SD 133), respectively. Extubation was performed in the operating room in 125 patients. Post-operative invasive ventilation was maintained in the recovery room in fifteen patients for a mean duration of 72.7 min (SD148.2). Only one patient was admitted to intensive care for 15 h. NIV was performed in three patients for a mean duration of 73.3 min (SD15.3).The mean recovery room staying was 79 min (SD 80). The mean hospital postoperative stay was a mean of 8.1 days (SD 5.7). No complications were found in 144 patients.

Conclusion: A program of fast-track anesthesia with a short stay in recovery room allowed achieving an optimal outcome, limiting the costs of intensive care admission.

Keywords: Anesthesia; Fast-track; Epidural Analgesia; Liver Surgery; Pancreatic Surgery; Cancer

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Introduction

Multimodal peri-operative management may hasten recovery and decrease morbidity and hospital stay following major surgical procedures [1-3]. Preoperative patient information, specific modalities to provide intra operative and postoperative analgesia and careful monitoring in the recovery room may result in a fast discharge to the surgical unit, without requiring intensive care unit admission. Patients undergoing pancreatic and liver surgery for cancer are considered as high-risk subjects to be cared for in specialistic centers. There are few published data for enhanced recovery after liver or pancreatic surgery. A fast-track program has been optimized in our department to keep the costs down while providing the optimal outcome for cancer patients with liver or pancreatic cancer. The aim of this retrospective study was to analyze the outcomes of a protocol of fast-track anesthesia for major abdominal cancer procedures including pancreatic and liver surgery.

Methods

A retrospective analysis of consecutive patients, who underwent hepatopancreatobiliary surgery for cancer for a period of 12 months at La Maddalena Cancer center, was performed. This is a comprehensive cancer center with a high volume cancer surgery unit acting as a tertiary center for the entire region. Given the retrospective nature of the paper, ethical committee approval was deemed to be un-necessary, unless for institutional authorization to review the charts.

Table 1: Pearson's chi-square test or Fisher exact test, as needed; § Univariate Analysis Of Variance (ANOVA).

	Pancreas (56 Pts.)	Liver (107 Pts.)	P
Age	67.9 (14.1)	68.4 (11.5)	0.798§
Gender (M/F)	24/32	53/54	0.418*
Duration of anesthetics (minutes)	416 (116)	272 (108)	<0.0005
Duration surgery (minutes)	386 (131)	250 (109)	<0.0005
Recovery room staying (minutes)	98 (131)	70 (24)	0.045
Invasive ventilation (n°)	6 pts	9pts	0.776*
Mean duration (minutes)	141.7 (227.3)	26.7 (14.1)	0.147§
NIV (n°)	1 pt	2 pts	1.0*
Mean duration (minutes)	(60 min)	(80min)	
Vasoactive drugs (n°)	33 pts	51 pts	0.189*
Mean duration (minutes)	1175 (732)	670 (609)	0.001§
Red cell transfusion (n pts, mean number)	4 pts	3 pts	0.233*
Plasma units (n° pts, n° unit)	1 pt	1pt	1.0*
Hospital stay (days (SD))	15 (9.5)	7.9 (4.6)	<0.0005§
Postoperative stay (days(SD))	10.6 (8.5)	6.8 (2.7)	<0.0005§
Dildo-Clavien			
0	46	101	0.023*
I	4	3	0.233*
II	2	0	0.116*
III	0	3	0.551*
V	4	0	0.012*
Mortality	4	1	0.002*

Anesthesiological process

All procedures are routinely used by anesthetic team to provide homogeneous and optimal recovery after surgery allowing a safe discharge to surgical ward where they are continuously monitored for 24 h to 48 h. All patients were pre medicated with fentanyl 50 µg, diazepam 5 mg and dehydrobenzoperidol 2.5 mg, and started gelatin infusion before performing epidural analgesia at T8-T10. After a test dose, 10 ml of lidocaine 2% were injected and a continuous infusion of levobupivacaine 0.125% at 8 to 10 ml/hr was started, preceded by a bolus of epidural morphine 3 mg. Anesthesia was induced by propofol, fentanyl and succinylcholine, and then maintained with desflurane, fentanyl, and rocuronium. A combination of neostigmine-atropine was used for the reversal of muscular relaxation. If epidural analgesia was contraindicated or not accepted by patients, intravenous postoperative analgesia with methadone was offered, after dose titration up to a successful dose in the recovery room. Subsequent doses were administered every eight hours postoperatively for 48 h and then tapered according to the clinical needs. Patients were preferentially extubated, when possible, in the operating room, and then admitted to the Recovery Room (RR) for complete monitoring and appropriate warming with blankets. The occurrence of possible complications or symptoms in the recovery room (pain, nausea, shivering, and so on) was treated consequentially. When patients achieved an adequate score [4], patients were discharged to the ward where they were monitored for 24 h to 48 h. Otherwise, they were maintained under strict control in an intensive care unit. Postoperative pain was assessed regularly by means of a numerical scale 0-10, according to local nursing policy. Epidural catheters were removed 48 h after operation and intravenous/oral opioids were offered when necessary according to the needs.

Data retrieved

Epidemiologic data were recorded. Duration of anesthesia, surgery, and RR staying were recorded. The need of invasive ventilation and its mean duration, the use of Non-Invasive Ventilation (NIV) and its duration in the recovery room or eventually in the surgery unit were also recorded. The use of vasoactive drugs, including dobutamine and noradrenaline, red cell and plasma units transfusions, global hospital stay, morbidity, and mortality were also recorded. Complications were graded according to the Dindo-Clavien classification [5].

Statistical analysis

Statistical analysis of quantitative and qualitative data, including descriptive statistics, was performed for all items. Continuous data are expressed as mean ± SD, unless otherwise specified. Differences between groups were assessed by the chi-square test or Fisher exact test, as needed for categorical variables. The Univariate Analysis Of Variance (ANOVA) was performed for parametric variables. Data were analyzed by the Epi Info software (version 6.0, Centers for Disease Control and Prevention, Atlanta, GA, USA) and SPSS Software (version 21.0, SPSS Inc, Chicago, IL, USA). All P-values were two-sided and P-values less than 0.05 were considered statistically significant.

Results

A total of 163 patients were examined. Fifty-six patients underwent surgery for pancreatic cancer, and 107 patients underwent liver surgery for primary tumor or metastases (Table 1). The mean age of patients was 68.2 years (SD 12.4), and 77 patients (42.7%) were males. The median ASA physical status was 3, with 132 patients belonging to this category. The mean duration of anesthesia was 322 minutes

(SD 320), and the mean duration of surgery was 296 min (SD 133). One-hundred-forty-seven anesthetics (90%) were blended anesthesia (general and epidural analgesia). The remaining interventions were performed under general anesthesia only. Extubation was performed in the operating room in 125 patients (76.7%). Post-operative invasive ventilation was maintained in RR in fifteen patients for a mean duration of 72.7 min (SD 148.2), with one patient admitted to intensive care for 15 h. NIV was performed in three patients for a mean duration of 73.3 min (SD 15.3). The mean RR staying was 79 min (SD 80). In Table 1, data are presented according to the type of surgery. Data regarding the use of inotropic drugs in the postoperative period were available for 141 patients. 84 of them (59%) received dobutamine (n.50), noradrenaline (n.19), or both dobutamine and adrenaline (n.15) along the peri-operative period for a mean period of 520 min (SD 689). Red cells transfusions were performed in 7 patients (mean 2.3 units, SD 1.1 for patient transfused). Plasma units were transfused in 2 patients (mean 7.5 units, SD 3.5 for patient). The mean hospital stay was 10.3 days (SD 7.5), with a mean of 8.1 days (SD 5.7) of post-operative period. No complications were found in 144 patients. Principal postoperative complications were as follows: biliary leak requiring endoscopic intervention (1), biliary fistula (1), pancreatic-biliary fistula (1), ischemic cerebral attack (1), paralytic ileum (1) laparotomy deiscence (1), ileostomy evisceratio (1), wound infection (1), pneumothorax (1), limphocele (1), liver abscess (1), peri-pancreatic blood collection (1) (see Dildo-Clavien classification in Table 1).

Discussion

In the last decade, improvements in surgical techniques and peri-operative management have dramatically improved the outcome of major abdominal surgery for cancer [6]. In this study a fast-track anesthesia allowed to transfer most patients to the surgical ward, after staying in RR until adequate stabilization was achieved. This resulted in a good post-operative outcome, avoiding admission to intensive care despite the duration of major abdominal cancer surgery. This result allowed a better availability of intensive care beds and limitation of costs, maintaining an acceptable outcome for patients. In fact only one patient required an admission to intensive care for just one day, despite almost patients were ASA 3.

In recent years, several forms of enhanced recovery protocol for major abdominal cancer surgery have been proposed. In comparison with data reported about ten years ago in a Scandinavian country [7], or large series of hepatic resections [8], this approach allowed a median postoperative length stay of 6 days [9], although these authors also included laparoscopic procedures. In another study the median postoperative length stay was 5 days, although patients with ASA status of 3 were managed in an intensive care on the first postoperative night [2]. The median stay following pancreatic resection has been reported to be higher, about 16 days [10]. Optimal pain management is one of the most important factor to ameliorate postoperative recovery after liver or pancreatic surgery [11], possibly decreasing the length of stay after surgery. Perioperative mortality following pancreatic surgery has been reported to have an incidence of 1% to 4%, and morbidity still remains high [12]. In these patients the mortality rate was higher than patients undergoing hepatic surgery. This data was expected. Mortality and complications of pancreatic surgery occur more commonly in elderly patients [13]. Again, almost all patients were ASA 3, and death was not attributable to the fast track protocol. Overall in-hospital mortality was 9.5%, with leak of the pancreatic-jejunal anastomosis being the most frequent

complication (16%) [14], although some other experiences reported in a high volume center, mortality rate was 2.1% [15].

Limitations of the study are represented by its retrospective nature. However, the quality of data collection was sufficient to gather useful information about cancer patients undergoing pancreatic and liver surgery.

Conclusion

A program of fast-track anesthesia with a short stay in recovery room allowed achieving an optimal outcome, limiting the costs of intensive care admission. Complications were not related to discharge to the unit.

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