

## Perioperative Management of Pancreaticoduodenectomy

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### Summary

The importance of perioperative management in pancreaticoduodenectomy has trebled, as the size of the elderly population continues to increase yearly. Recently, in our department, 17.6 percent of 159 patients undergoing pancreaticoduodenectomy were 75 years or older. Of greatest concern is the prevention of postoperative pneumonia. We have obtained favorable results through preoperative care by having patients strengthen respiratory muscles through incentive spirometry, practice walking, going up and down stairs, and practice expectoration of sputum using tissues. In postoperative care, we consistently apply, whenever appropriate, tapping and vibration to the entire back, prone therapy, and hyperbaric oxygen therapy, among other things. In preparation for surgery, we make the patient conscious of the imminent major surgery, as the patient must exhibit a strong will and readiness to fight the disease. This article also explains the importance and methods of drain placement and continuous lavage of the drains in relation to pancreaticoduodenectomy. (Kimura in *Geka (Nankodo. Co)* 74: 1091-1095, 2012)

**Key words :** pancreaticoduodenectomy, performance status, getting ready for surgery

### Introduction

Pancreaticoduodenectomy typically involves removal of multiple organs followed by several reconstruction procedures, such as pancreaticojejunostomy, choledochojejunostomy, and gastrojejunostomy (Figure 1).<sup>1)</sup> The prospect of a fair amount of hemorrhage should be considered since the entire surgery is lengthy, distinguishing it from more routine gastric and intestinal operations. In addition, as pancreaticoduodenectomy includes anastomoses between the pancreas and the gastrointestinal system, postoperative care needs to embrace the possibility of fistula formation and hemorrhaging.

Year after year, disorders requiring surgery are increasing among the elderly. This is primarily due the fact that more elderly people are being stricken with cancer. Therefore, pancreaticoduodenectomies

are being performed more often in the elderly (Figure 2). Recently, in our department, 17.6 percent of 159 pancreaticoduodenectomies were performed on patients aged 75 years or older.

Thus, indications for surgery need to strictly reflect consideration of patient performance status (PS, detailed below), the extensiveness and difficulty of the surgery, and the likelihood of complications.<sup>2)</sup>

### I. Performance Status (PS)

**PS0:** Can participate in society with no symptoms, has no restrictions, and can act in the same way as before onset.

**PS1:** Exhibits mild symptoms, may not engage in heavy labor, but can walk and do deskwork or light labor such as some housekeeping or administrative chores.

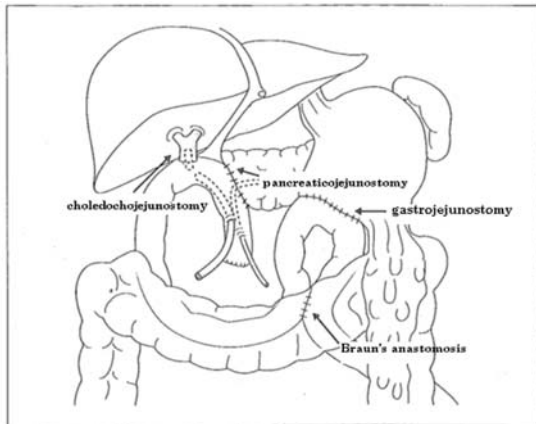


Figure 1. Reconstruction after pancreaticoduodenectomy.

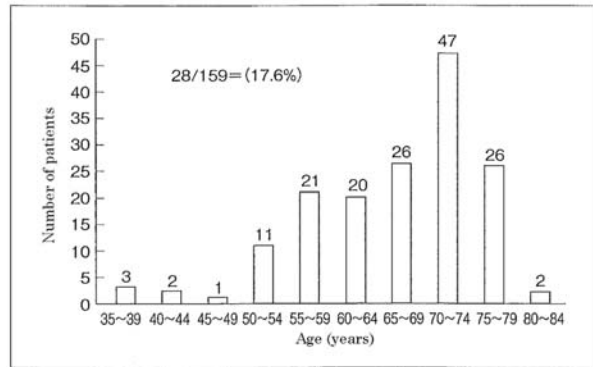


Figure 2. Ages and numbers of patients who have undergone pancreaticoduodenectomy in our department.

Twenty-eight (17.6 percent) of the 159 patients who had pancreaticoduodenectomy were 75 years of age or older.

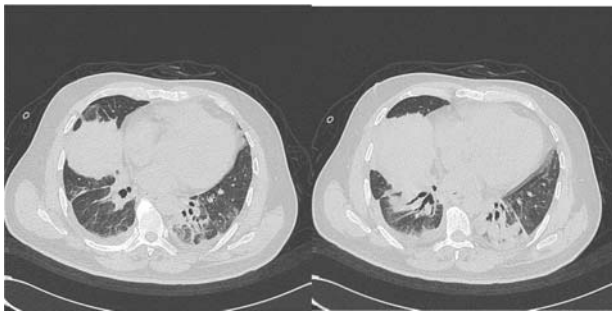


Figure 3. A case of a 65-year-old male. Thoracic CT showing pneumonia following pancreaticoduodenectomy.

Lying in a supine position and not moving as well as failing to expectorate sputum can bring on hypostatic pneumonia.

**PS2:** Can walk and do tasks in one's immediate environment, but may at times require a little assistance. May not do light labor, but is up and about for more than half of the day.

**PS3:** Can do tasks in one's immediate environment to some extent, but frequently needs assistance. Spends more than half of the daytime in bed.

**PS4:** Cannot attend to tasks in one's immediate environment, constantly needs assistance, and is bedridden.

Ordinary surgery should in general be indicated for patients with a PS of up to PS2, with decisions concerning PS3 or PS4 requiring careful deliberation; for patients with PS4, surgery should especially be limited to life-threatening situations. Pancreaticoduodenectomy would best be reserved for patients with PS2 or better.



Figure 4. Incentive spirometry.

Preoperative training of the respiratory musculature by incentive spirometry. The patient does this as often as possible, and it may be continued postoperatively as well.

Instructions. Maintain an upright posture while seated. Breathe in as vigorously as possible, aiming at raising three balls. Turn the spirometer upside down. Now breathe out as vigorously as possible in order to raise two balls.

## II. Patient Preparedness and Pre- and Postoperative Management

The patient's "will" is an important factor. Some patients appear to almost blame their doctors for their medical conditions, or at least expect all their problems to be solved, once they arrive at the hospital. However, it does not really work that way. Once surgery is scheduled, doctors, nurses, and other healthcare professionals put forth their best efforts to obtain the best results. The steps they take both



Figure 5. Preoperative walking practice.



Figure 6. Preoperative rehearsal of expectorating sputum using tissues.

Table 1. Getting ready for surgery (taken from reference 3)

Tell the patient, “You’ll be in for a severe surgery!” It is necessary to raise the patient’s state of mind to that of a strong will and readiness to fight disease.

before and after the operation to give the patients their best possible chances of recovering are rigorous. To this end, patient attitude and drive are important and should reflect assertive thoughts such as “I’m going to fight this disease, get through the surgery, and overcome any postoperative complications!”

The methodology for managing this is all laid out preoperatively. The most important thing is to prevent postoperative pneumonia (Figure 3). Hence, before surgery, the patient engages in (1) incentive spirometry (Tri-Ball Respiratory Trainer, Covidien) to strengthen the respiratory muscles (Figure 4) constantly on a daily basis whenever time allows; (2) walking practice (Figure 5) and going up and down stairs; and (3) coughing practice using tissues (Figure 6) in preparation of the postoperative need for coughing up sputum. Postoperatively, (1) tapping and vibration applied to the entire back, (2) prone therapy, (3) hyperbaric oxygen therapy, (4) tracheostomy, and (5) hyperbaric oxygen therapy should be continually undertaken, as appropriate. The first three items are performed at bedside, assisted by doctors and nurses, who should be talking to the patient as they work. If the preoperative preparation period becomes lengthy, family members who remain in the ward with the

patient can be recruited to assist within safe limits. Thus, the patient must be made to realize from the beginning that he/she is in for “severe surgery.” Patient consciousness needs to be elevated to that of a strong will and emanate readiness to fight the disease (Table 1).

Conversely, the surgeon should consider carefully how far to go, especially if the question relates to performing a pancreaticoduodenectomy in an elderly patient. Thinking like a coward might not be a bad idea. A surgeon would be well advised to read the newspaper clipping, “Have the courage to be called a coward,” from the “Vox populi, vox dei” column of the *Asahi Shinbun* (Table 2).

### III. Informed Consent

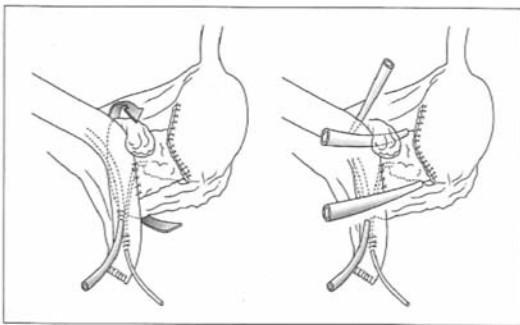
Informed consent should be based on taking the above ideas into consideration. The patient should be informed well enough to understand the need for surgery and what his or her condition really is. If the nature of the problem warrants it, the patient should know whether surgery is not necessarily the only viable option. Moreover, surgical complications must be clearly explained, especially what their odds are like if the patient is elderly or has other preexisting

**Table 2. “Have the courage to be called a coward,” excerpted from the morning edition front-page column, “Vox populi, vox dei,” of the *Asahi Shinbun* (July 19, 2009)**

In 1966, one major accident was following another in the skies over Japan. In March, a Canadian airliner made attempts to land in the fog at Haneda airport but crashed and burned, killing 64 people. Shortly before the accident, a Japan Airlines flight also tried to land in Haneda but gave up and went to Fukuoka instead.

This was the Seto flight from Hawaii. The weather looked as if it would barely permit the plane to land. The plane tried to touch ground twice, but the runway was just too difficult to see. Not confident that he could make a safe landing, the captain changed the course. With Tokyo right before their very eyes, disgruntled voices arose from among the passengers.

At Fukuoka, the passengers became only grumpier as they waited, because the immigration procedures were all tied up. They finally exited into the lobby where television screens displayed the Canadian plane in flames for all to see. Discontent toward the captain was instantly transformed into gratitude.



**Figure 7. Placement of drains during pancreaticoduodenectomy.**



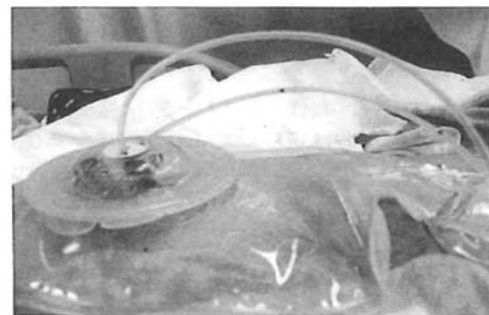
**Figure 8. Drains managed with watertight seals.**

Many large tubes (drains) run through openings in the upper abdomen. Sputum is difficult to expectorate after surgery.



**Figure 9. Continuous lavage.**

Insertion of an Atom Tube in a Phycon drain (Fuji Systems) to provide maintained irrigation.



**Figure 10. Managing the irrigant of continuous lavage.**

With the irrigant for continuous lavage managed by Lapack (Surgidrain Open Top, Alcare), no fluids leak, and the patient can comfortably get on with life.

complications. The patient must fully understand that agreeing to surgery means agreeing to the possibility of an unfavorable surgical outcome. The final decision is then left to the patient and family.<sup>2)</sup>

#### **IV. Drainage Management of Pancreaticoduodenectomy**

Figure 7 shows placement of drains during surgery.<sup>1)</sup>

Multiple drains are used, not to make the drainage of the pancreatic stump more thorough, but to better prevent complete stoppage of draining if a tube

happens to slip out. The drains are arranged to reach the abdominal wall in the shortest distance possible and are managed as a completely closed system<sup>3)</sup>. They are sealed watertight so that the distance between the patient and the floor enables negative pressure to be applied to draining the surgical site (Figure 8).

If the drained fluid contains pancreatic juice, it will have a high amylase content, and if infection also exists, the fluid will be viscous and look dirty. When the drained fluid becomes sticky, and localized irrigation is considered necessary to fend off infection, Atom Tubes (Atom Medical) can be inserted into the drains—not quite to the end of each drain—and an irrigant (saline) can be run through the system to provide continuous lavage (Figures 9 and 10)<sup>4)</sup>.

### In Closing

This article has discussed perioperative management of pancreaticoduodenectomy. Preventing postoperative pneumonia, particularly in an elderly patient, and having the patient mentally prepared for the operation are important issues.

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