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The Trend of Perioperative Care of Gastrectomy in Kanagawa, Japan

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Comprehensive surveys on perioperative care in Japan, including that in community or private hospitals, have not been reported, and current trends remain unclear. The present survey was designed to investigate current routines for perioperative care in patients who undergo surgery for gastric cancer in Kanagawa, Japan. A questionnaire was designed specifically to obtain information on perioperative routines in patients with gastric cancer throughout Kanagawa. A total of 55 hospitals in Kanagawa responded. Most hospitals perform antimicrobial prophylaxis every 3 hours intraoperatively, use a postoperative drainage tube, use a urinary catheter for only 2 days after surgery, administer epidural anesthesia, and encourage early mobilization. Liquid intake until 3 hours before surgery is not allowed in most hospitals. Most hospitals do not routinely provide preoperative nutrition support, perform bowel mechanical preparation, administer prophylaxis against thromboembolism, place a postoperative nasogastric tube, attempt to maintain normovolemia, or administer planned nonsteroidal anti-inflammatory drugs. The day of restarting drinking or eating varies considerably. Many elements of perioperative management, especially postoperative oral nutrition, have yet to be standardized for patients with gastric cancer in Japan.

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There are great gaps between clinical practice and evidence-based practice in fluid management and drain usage.

Key words: Gastric cancer – Surgery – Perioperative care – Comprehensive survey study – Current trend – Clinical practice

Gastric cancer (GC) is the third leading cause of cancer-related death worldwide.[1] Although complete surgical resection is a prerequisite to the cure of gastric cancer, the perioperative care of patients who undergo gastrectomy remains to be standardized, largely because comprehensive evidence is lacking. At present, various perioperative care protocols are followed in different hospitals. Recently, several studies have demonstrated that newly developed perioperative care protocols are superior to traditional care in terms of factors such as postoperative nutrition and pain control.[2] In patients who undergo surgery for colorectal cancer, new perioperative care protocols, such as fast-track surgery or Enhanced Recovery After Surgery (ERAS) programs, have been developed and are now widely used.[3] However, such perioperative care programs are not yet routinely followed in patients who undergo surgery for gastric cancer. In some Japanese hospitals, perioperative care is changing radically.

Previous surveys of perioperative care management were performed at high-volume centers in Northern Europe and Eastern Asia.[4,5] In Japan, however, many patients with gastric cancer undergo surgery in hospitals/institutions other than high-volume centers because gastric cancer is a common disease and patient centralization is unusual. To our knowledge, comprehensive surveys of perioperative care, including that in community or private hospitals, have not been reported, and trends in perioperative care in Japan remain unclear. Because Kanagawa Prefecture has urban, suburban, and rural areas, it is considered a microcosm of Japan. The results of surveys on perioperative care in Kanagawa Prefecture might thus reflect the overall situation in Japan. We performed the present survey to investigate current practices for routine perioperative care in patients who undergo surgery for gastric cancer in Kanagawa Prefecture, Japan.

Methods

The Kanagawa Gastrointestinal Surgery Study Group was established in 1976 and currently includes 128 hospitals located in Kanagawa Prefecture, Japan. The member hospitals include university hospitals, cancer centers, community hospitals, and private hospitals that currently perform surgery for gastric cancer.

A questionnaire was specifically designed to obtain information on perioperative routines for gastric cancer surgery throughout Kanagawa Prefecture, Japan. Some of the questions were based on ERAS elements.[2] The questionnaire was mailed to the chief of gastrointestinal surgery of each hospital in autumn 2013. They were asked to respond to a questionnaire concerning the routine perioperative care of patients without complications who undergo open distal gastrectomy (ODG), laparoscopic distal gastrectomy (LDG), open total gastrectomy (OTG), and laparoscopic total gastrectomy (LTG). If no response was obtained after the initial mailing, the department chiefs were reminded by telephone. The questionnaire consisted of 14 items, as shown as Table 1.

Results

Of the 128 hospitals in Kanagawa Prefecture, 55 (43.0%) responded. The respondents included 22 of the 24 hospitals (91.7%) designated as cancer treatment base hospitals by the national or prefectural government. Eight hospitals had not introduced LDG, and 22 hospitals had not introduced LTG. These hospitals were excluded from the analyses concerning each of the respective procedures.

Most hospitals do not provide routine preoperative nutrition support (ODG, 92.7%; LDG, 95.7%; OTG, 92.7%; LTG, 100%; Table 2). More than 60% of the hospitals do not routinely perform mechanical bowel preparation (ODG, 69.1%; LDG, 70.2%; OTG, 67.3%; LTG, 60.6%; Table 2). Patients in 36% to 44% of the hospitals can drink water, clear liquids, or carbohydrate preparations until 2 to 3 hours before surgery (ODG, 43.6%; LDG, 44.7%; OTG, 43.6%; LTG, 36.4%; Table 2). Antimicrobial prophylaxis every 3 hours intraoperatively is routinely performed in 83% to 90% of hospitals (ODG, 83.6%;

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Table 1 Form used for the survey of perioperative routines

Preoperative nutrition support	
Do patients receive routine preoperative nutrition support?	Yes or No
Mechanical bowel preparation	
Do patients receive routine mechanical bowel preparation preoperatively?	Yes or No
Avoiding preoperative fasting	
Can patients avoid preoperative fasting and be allowed to drink water, clear liquids, or carbohydrate preparations 2–3 hours before surgery?	Yes or No
Antibacterial prophylaxis	
Do patients receive routine antibacterial prophylaxis every 3 hours intraoperatively?	Yes or No
Prophylaxis against thromboembolism	
Do patients receive routine prophylaxis against thromboembolism?	Yes or No
Nasogastric intubation	Yes or No
Is a nasogastric tube used routinely in the postoperative period?	Duration: _____ days
Fluid management	
Are intravenous fluids routinely managed to maintain normovolemia and avoid fluid excess perioperatively?	Yes or No
Postoperative drainage of peritoneal cavity	
Is a postoperative drain used routinely?	Yes or No
Planned removal of urinary catheter	
Is the urinary catheter removed 1–2 days after surgery?	Yes or No
Epidural analgesia	
Do patients receive routine epidural analgesia intraoperatively and postoperatively?	Yes or No
Planned NSAIDs	
Do patients receive planned NSAIDs postoperatively?	Yes or No
Postoperative drinking	
When do patients restart drinking postoperatively?	POD _____
Postoperative nutrition	
When do patients resume intake of liquid or solid nutrition?	POD _____
Early mobilization	
When are patients encouraged to walk?	POD _____

POD, postoperative day.

LDG, 89.4%; OTG, 83.6%; LTG, 90.9%; Table 2). Only 12% to 15% of hospitals routinely administer prophylaxis against thromboembolism (ODG, 12.7%; LDG, 14.9%; OTG, 12.7%; LTG, 15.2%; Table 2).

Most hospitals use a postoperative nasogastric tube (NGT) only on the day of surgery and postoperative day 1 (Fig. 1). Only 8% to 12% of hospitals routinely attempt to maintain normovolemia and avoid fluid excess (ODG, 9.1%; LDG, 8.5%; OTG, 9.1%; LTG, 12.1%; Table 2). Some hospitals do not place a drainage tube in the peritoneal cavity in patients who undergo distal gastrectomy (ODG, 16.3%; LDG, 12.8%). In total gastrectomy, however, nearly all hospitals place a drainage tube in the peritoneal cavity for several days after surgery (OTG, 96.4%; LTG, 97.0%; Table 2). In most hospitals, a urinary catheter is used for only 1 or 2 days after surgery (ODG, 68.5%; LDG, 72.3%; OTG, 67.2%; LTG, 78.8%; Table 2). In a very high proportion of hospitals, postoperative epidural anesthesia is administered (ODG, 96.2%; LDG, 91.5%; OTG, 96.4%; LTG, 87.9%). Two hospitals use epidural anesthesia for open surgery but not for laparoscopic surgery (Table 2). Some hospitals administer planned nonsteroidal anti-inflammatory drugs (NSAIDS) postoperatively (ODG, 14.5%; LDG, 17.0%; OTG, 14.5%; LTG, 21.2%; Table 2).

The day on which patients start to drink water postoperatively varies considerably. One hospital let patients drink water on the day of surgery (Fig. 2). The day of restarting oral intake after surgery also varies widely. Some hospitals allow patients to restart oral nutrition on postoperative day 1 or 2. On the other hand, other hospitals do not allow patients to restart oral nutrition for 1 week (Fig. 3). All hospitals encouraged early patient mobilization after surgery (Table 2).

Discussion

Our results demonstrated that perioperative management procedures in patients who undergo gastric surgery vary widely in Kanagawa Prefecture, Japan. On the other hand, management procedures for gastric surgery are changing day by day at each hospital, and many elements of perioperative management remain controversial.[2] These factors

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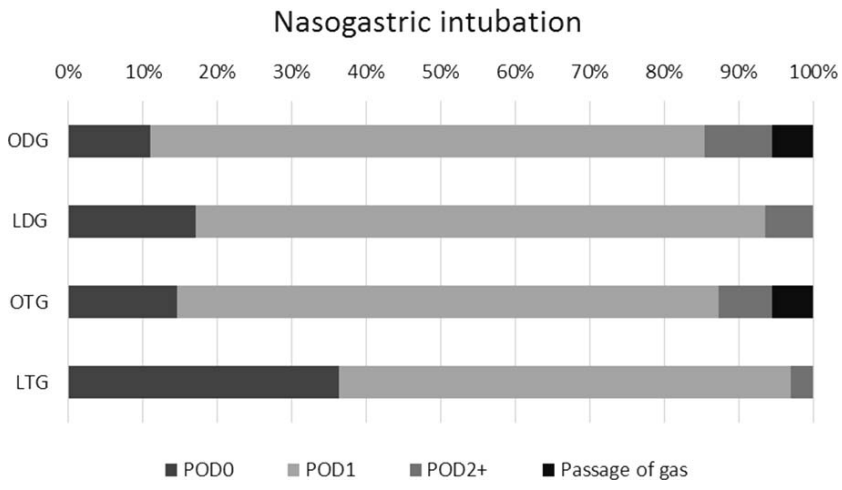

Fig. 1 Nasogastric intubation. POD, postoperative day.

Table 2 Table of results

	ODG, n (%)	LDG, n (%)	OTG, n (%)	LTG, n (%)
Preoperative nutrition support				
Yes	4 (7)	2 (4)	4 (7)	0 (0)
No	51 (93)	45 (96)	51 (93)	33 (100)
Mechanical bowel preparation				
Yes	17 (31)	14 (30)	18 (33)	13 (39)
No	28 (69)	33 (70)	37 (67)	20 (61)
Avoiding preoperative fasting				
Yes	24 (44)	21 (45)	24 (44)	12 (36)
No	31 (56)	26 (55)	31 (56)	21 (64)
Antimicrobial prophylaxis				
Yes	46 (84)	42 (89)	46 (84)	30 (91)
No	9 (16)	5 (11)	9 (16)	3 (9)
Prophylaxis against thromboembolism				
Yes	7 (13)	7 (15)	7 (13)	5 (15)
No	48 (87)	40 (85)	48 (87)	28 (85)
Fluid management				
Yes	5 (9)	4 (9)	5 (9)	4 (12)
No	50 (91)	43 (91)	50 (91)	29 (88)
Drainage tube				
Yes	46 (84)	41 (87)	53 (96)	32 (97)
No	9 (16)	6 (13)	2 (4)	1 (3)
Planned removal of a urinary catheter				
Yes	37 (67)	34 (72)	37 (67)	24 (73)
No	18 (33)	13 (28)	18 (33)	9 (27)
Epidural analgesia				
Yes	53 (96)	43 (91)	53 (96)	29 (88)
No	2 (4)	4 (9)	2 (4)	4 (12)
Planned NSAIDs				
Yes	8 (15)	8 (17)	8 (15)	7 (21)
No	47 (85)	39 (83)	47 (85)	26 (79)
Early mobilization				
PODs 1–3	55 (100)	47 (100)	55 (100)	33 (100)
POD 4+	0 (0)	0 (0)	0 (0)	0 (0)

POD, postoperative day.

may account for the wide variations in perioperative management. It is therefore very important to understand general trends in a community at a given time.

In patients who undergo gastrointestinal surgery, perioperative bowel usage is essential. The value of preoperative nutrition for nonmalnourished patients is not supported by robust evidence.[2] Many surgeons consider routine preoperative nutrition support unnecessary and believe that it is difficult to control the quality of preoperative nutrition before admission. Such surgeons' concerns might limit the spread of preoperative nutrition. Mechanical bowel preparation and avoiding preoperative fasting were not performed by many surgeons in the present survey. It seems that these procedures are not beneficial even in colonic surgery or gastric surgery. Previous studies of several major surgical procedures at least suggest that mechanical bowel preparation has no benefit.[2,6,7] Preoperative fasting from midnight is also not supported by available evidence.[2,8] In contrast, preoperative oral rehydration or carbohydrate loading was reported to be effective on insulin resistance and may reduce length of stay.[9,10] Furthermore, it is not difficult to discontinue the practice of fasting. These factors have led to the decreasing popularity of preoperative fasting.

As for the resumption of oral intake after operation, early resumption of drinking water is the predominant practice; however, postoperative resumption of nutrition is extremely diverse. Recently, several studies reported that early oral intake after gastrectomy is safe, feasible, and effective.[11–13] However, the evidence level is not that high yet. Some surgeons believe that early resumption of oral feeding may exacerbate the grade of any anasto-

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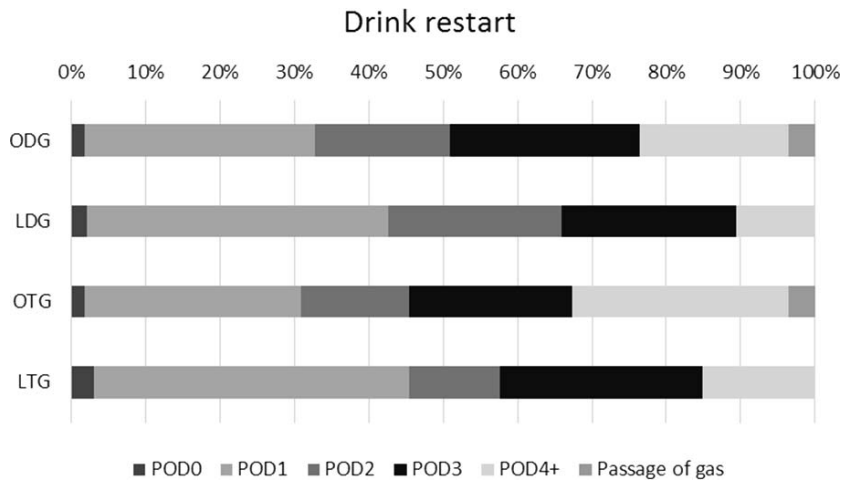

Fig. 2 Drink restart. POD, postoperative day.

motic leakage that occurs. Further assessments and studies are necessary to confirm the optimal time for restarting oral nutrition.

Although a near-zero fluid balance is strongly recommended by the ERAS guidelines,[2] few hospitals have introduced this item at present. Several reasons may account for this. First, this concept is not yet widely accepted. Second, intraoperative fluid management depends entirely on the judgment of each anesthesiologist. Third, special devices and procedures are needed to monitor hemodynamics in some patients, such as pulmonary artery catheters and transesophageal Doppler ultrasonographs.[14] It is necessary to make surgeons and anesthesiologists aware of the concept of near-zero fluid balance and to develop simple and inexpensive monitoring techniques.

Postoperative resumption of mobilization is related to multiple factors. Pain relief and patient encouragement are important promoters of early mobilization. For postoperative pain control, epidural anesthesia is recommended and widely used.[2] Two hospitals revised the procedures for pain management and established different recommendations for open surgery and laparoscopic surgery during the present survey. Two meta-analyses have shown that LDG requires a lower level of postoperative analgesia than ODG.[15,16] However, the differences are not so great. Planned use of NSAIDs is not common. In practice, NSAIDS are needed to control postoperative pain. Consequently, some surgeons most likely consider the planned use of NSAIDs to be useful. Evidence supporting the planned use of NSAIDS is inconsistent. On the other hand, factors that negatively affect mobilization include NGT, drains, and urinary catheters. Traditionally, an NGT has been placed near the anastomosis for several days after gastrectomy. It

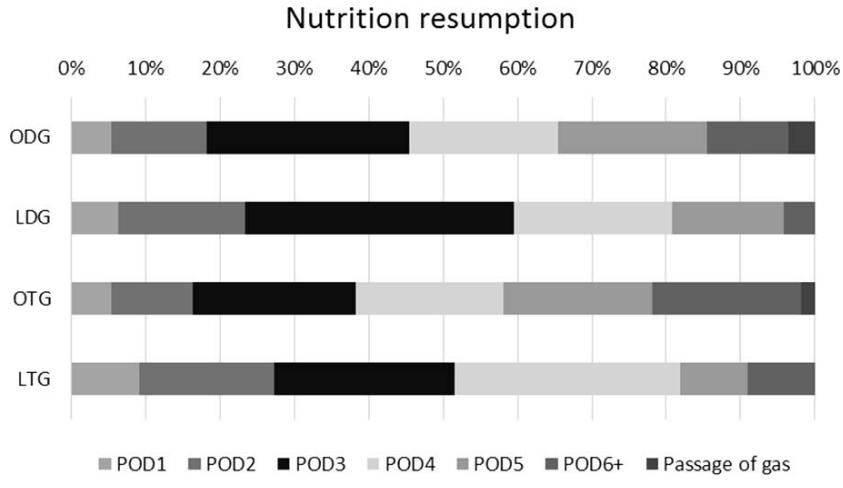

Fig. 3 Nutrition resumption. POD, postoperative day.

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was believed that NGT could reduce luminal pressure and prevent anastomotic leakage, but supporting evidence is lacking. A meta-analysis and a Cochrane review suggested that a postoperative NGT might induce pulmonary complications.[17,18] The ERAS guidelines therefore recommend against the use of an NGT.[2] Consequently, most hospitals reported that they remove the NGT on postoperative day 1 or 2 in the present survey. Postoperative drainage of the peritoneal cavity was the dominant practice in our survey, especially in patients who underwent total gastrectomy. Several studies concluded that the routine use of a postoperative drain is not warranted, even after total gastrectomy.[19–21] However, these studies did not have a sufficient number of clinically significant complications after gastrectomy, such as anastomotic leakage and pancreatic fistula. Most surgeons probably believe that a postoperative drain can prevent these complications from developing and becoming more severe, and thus reduce the need for reoperation. However, these claims are not supported by firm evidence. Clinically, it is necessary to confirm whether the expected benefits of drain placement outweigh the potential risks in each patient.

Our survey had several limitations. The response rate to the questionnaire was not very high. However, we believe that our results reflect the general trends in perioperative management in Japan because active hospitals that actively perform gastrectomy were included as respondents. Although laparoscopic surgery is already common practice in institutions other than leading hospitals, most small private hospitals have not yet introduced laparoscopic surgery. Data on laparoscopic surgery, especially total gastrectomy, were therefore minimal compared with open surgery. Each respondent replied about the basic management of gastrectomy. In practice, clinicians customize surgical procedures and perioperative management according to the individual patient. We should therefore not consider that all patients are managed as described by the respondents to this survey.

Many elements of perioperative management, especially postoperative oral nutrition, have yet to be standardized in patients with gastric cancer in Japan. There are great gaps between clinical practice and evidence-based practice in fluid management and drain usage. This trend may be attributed to the lack of sufficient evidence to respond to clinical questions. Further studies are required to develop solutions to current problems.

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