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Use of a feeding tube to manage anastomotic stenosis after upper gastrointestinal surgery

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ABSTRACT

In cases of gastrointestinal (particularly gastroduodenal) anastomosis after total gastrectomy or distal gastrectomy, the anastomotic region may become stenotic just after operation for weeks, which can cause difficulty in eating or drinking and/or which may even cause vomiting.

The Kimura's tube allows the intestines to have a role in nutrition in such cases by administering nutritional food into them to be digested. Another advantage of this method is that when a thin Kimura's tube (such as 8 French) placed in the anal intestine further than anastomotic region, that is, the tip of the tube is set beyond the anastomosis. It not only works as a stent to pass nutrients from the stomach to the other side of the anastomotic stenosis, but also gradually allows gastric juices to pass through around the tubes. Therefore, it gradually makes transfer of substances possible, such as water, albumin, granular ferric oxide, liquid food, and thin rice gruel.

Further advantage is: The Kimura's tube may never occur ileus, as compared to the prophylactic nutritional tube, directory inserted into the jejunum at the operation.

Key words: a Feeding tube, gastrointestinal anastomosis, the remnant stomach, ballooning, postoperative anastomotic stenosis

Although a naso-enteral tube has some complications such as pneumonia, when it has been is used for long time in patients will chronic disease[1], this kind of tubes (using tiny tubes), the tip of which is set beyond the anastomosis are very efficient for patients in postoperative periods patients in two or three weeks (which is called the Kimura's tube). In cases of gastrointestinal (particularly gastroduodenal) anastomosis after total gastrectomy or distalgastrectomy, the anastomotic region may become stenotic just after operation for weeks, which can cause difficulty in eating or drinking and/or which may even cause vomiting. This leads to a malignant cycle in which the remaining stomach above the anastomosis expands due to obstruction and puts pressure on the anastomotic region, which makes the passage of secretions, such as gastric juices, even more difficult and leads to further expansion of the remaining stomach. Swelling of the anastomotic region with edema also occurs. In such cases, the shape of the remnant stomach become ballooning (Fig 1).

Insertion of a gastric tube to extract the remaining gastric fluid often leads to healing of the anastomotic stenosis within approximately 3 weeks. However, results of treatment vary depending on the method of anastomosis, e.g., whether Billroth B-I, B-II, or B-II-Roux-en-Y anastomosis was done and whether manual or mechanical suturing was performed. During this period when patients cannot consume food orally, they are managed with total parenteral nutrition using techniques such as intravenous hyperalimentation (IVH).

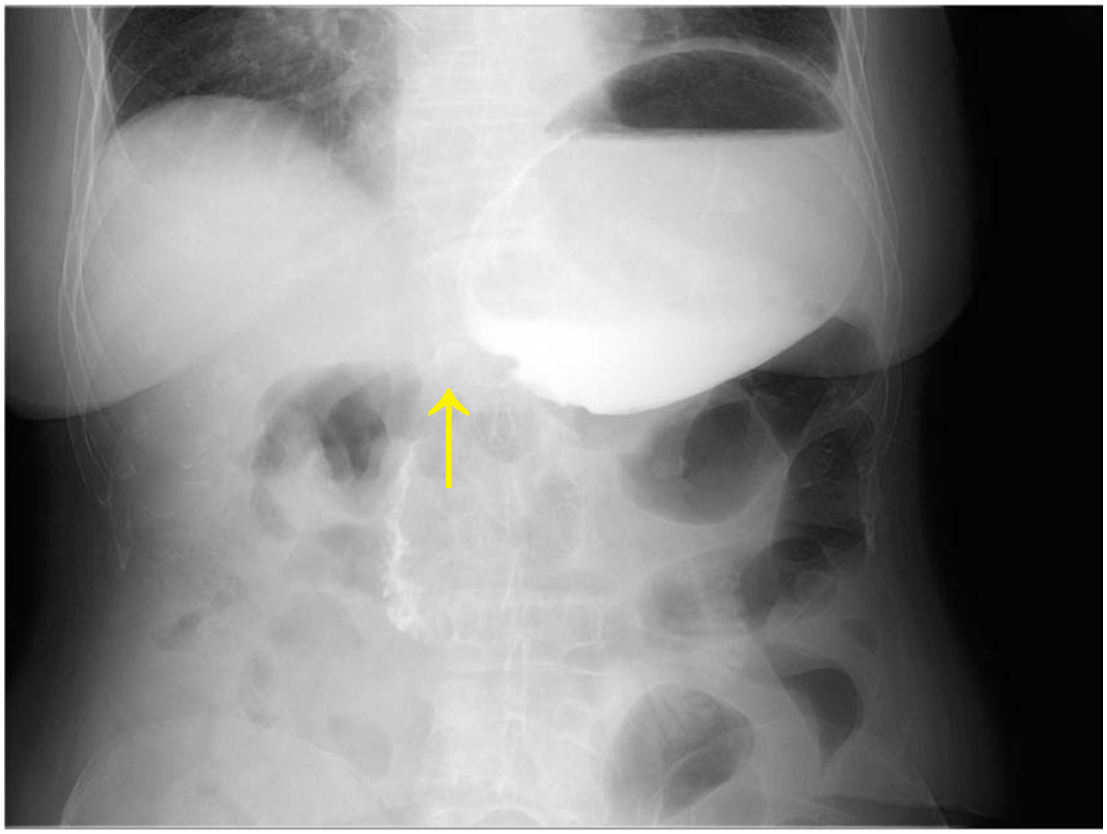

Figure 1. A case of gastroduodenal stenosis (the arrow) after distal gastrectomy. The remnant stomach is ballooning.

The purpose of the "the Kimura's tube" method is to insert a thin tube, such as one manufactured by Atom Medical (Dallas, TX, USA), transnasally through the anastomotic opening and into the jejunum so as to inject water or nutrients. This method is known to be effective and useful for postoperative management.

When oral nutrition is impossible in the relatively long-term postoperative period, such as after esophageal cancer surgery, water, nutrients, etc. can be administered to the patient through an intestinal fistula at the same time of surgery. However, sometimes it causes ileus.

For procedures where postoperative anastomotic stenosis is considered unlikely, such as gastrojejunostomy after gastrectomy, a gastrointestinal tube is rarely performed for prevention at opration. Accordingly, the small intestine is not used until oral ingestion is possible.

When the small intestine is not used (i.e., food is not passing through the small intestine), disuse atrophy of the intestinal epithelium and bacterial translocation[2] may occur. Above all, the action of food being digested and absorbed from the intestines is the best way for nutrients and micronutrients that have not even been accurately identified to be digested and absorbed into the body. Therefore, I believe that various unknown substances still exist that are essential for human life and that cannot be administered via IVH.

The Kimura's tube allows the intestines to have a role in nutrition in such cases by administering nutritional food into them to be digested. Another advantage of this method is that when a thin Kimura's tube (such as 8 French) placed in the anal intestine further than anastomotic region, that is, the tip of the tube is set beyond the anastomosis, it not only works as a stent to pass nutrients from the stomach to the other side of the anastomotic stenosis, but also gradually allows gastric juices to pass

Figure 2. Using the Wataru Kimura tube, the remnant stomach has become normal and dye passed well through the anastomosis (the arrow) after 1-2 weeks (a different but demonstrable case of Fig.1).

through around the tube. Therefore, it gradually makes transfer of substances possible, such as water, albumin, granular ferric oxide, liquid food, and thin rice gruel .

Further advantage is: The Kimura's tube may never occur ileus, as compared to the prophylactic nutritional tube, directory inserted into the jejunum at the operation.

The Kimura's tube can improve the shape of the anastomotic site of gastrojejunostomy and make it easier for food to pass through. Once this shape is formed (Fig 2), it will be maintained even when the feeding tube is removed, allowing for food to pass through the stomach without any blockage.

The serum albumin gradually increases after feeding using Kimura's tube for the patient with the stenosis of gastrojejunostomy (Fig. 3).

In case of a major surgery, such as subtotal esophagectomy for esophageal cancer, complications may include anastomotic leak at the esophagus-stomach anastomosis, and normal oral nutrition becoming impossible for a long period of time. Therefore, a feeding tube may be inserted directly to the jejunum from the peritoneal cavity at the same operation. This is as effective as the Kimura's tube and can be used immediately after surgery. However, one must be cautious of the fact that, in rare cases, intestinal obstruction may be caused by adhesion to the intestinal wall where this tube has been inserted. Adhesion is not possible if the Kimura's tube is used. Furthermore, because the Kimura's tube can be inserted after the anastomotic stenosis has occurred or when it appears likely to occur, its use is not restricted to only as a preventive measure.

Recently, the use of technology, such as upper gastrointestinal endoscopy, has made the Kimura's procedure through the sites of anastomotic stenosis, which had been quite difficult without visual guidance, much easier.

With regard to the pancreaticoduodenectomy, the in-hospital death after this operation was 2.8% among 8575 patients in one year, 2011, in Japan[3]. We used also Kimura's tube after this operation, if the stenosis of gastro-jejunostomy occued. Our in-hospital death of

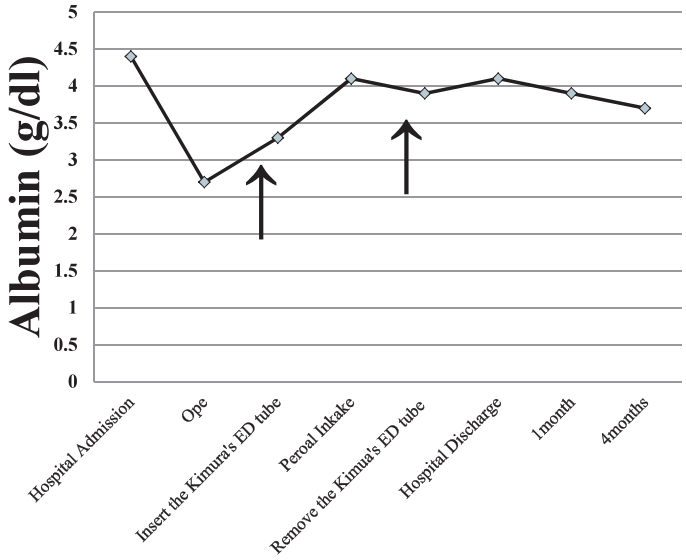

Figure 3. The serum albumin gradually increases after feeding using Kimura's tube for the patient with the stenosis of gastrojejunostomy (the arrow).

continuous 270 pancreaticodundenectomy cases during 17 years is zero %, with Kimura's tubes as well as the various intraoperative techniques, drainage systems, and so on[4].

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