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Early Enteral Feeding through Jejunostomy-Tube and Oral Route after Oesophagectomy

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Abstract: *The weight loss is a clinical condition frequently occurred in patients with oesophageal cancer. Optimised nutritional condition is essential for successful oesophageal surgery. So, adequate perioperative nutrition is required to achieve or maintain a best nutritional status. Early enteral feeding via jejunostomy-tube is currently widely accepted as a nutritional supplementation route after oesophagectomy.This nutrition method was associated with improved outcomes, including nutritional and functional outcome, quality of life and survival. However, related jejunostomy-tube complications may cause temporary interruption of feeding. Also, enteral feeding via jejunostomy-tube was associated with a long-term weight loss that occurred in 20-30 % of patients. Postoperative early oral feeding is an important element of the ERAS program and the more recent published reports clearly demonstrated the safety and benefits on outcomes of early oral feeding following oesophagectomy. However, scare of the published reports on the topic (early oral feeding after oesophagectomy) has resulted in lack to elaborate recommendations about the practice of early oral feeding after oesophagectomy. This brief review aims on the basis of most recent published reports to provide an overview on the early enteral feeding provided through jejunostomy-tube and oral route after oesophagectomy.*

Keywords: *Early enteral nutrition, jejunostomy –tube, oral feeding, outcome improvement*

1. Introduction

Oesophagectomy for cancer is a complex surgical procedure and associated morbidity rates remain high varying from 20% to 80% [1,2]. Anastigmatic leak is the most feared complication with a incidence ranging from of 5% to 40% [3]. Malnutrition is associated with high risk of postoperative morbidity and poor outcomes.

Linked to malignancy and insufficient oral intake, nutritional depletion or malnutrition is prevalent condition in patients with oesophageal cancer linked [4]. The key successful of any major surgical procedure is the optimisation of patient nutritional condition.

Therefore, malnutrition should be addressed perioperatively to improve outcomes, and nutritional support should be continued in the postoperative setting following oesophagectomy to maintain the best nutritional condition. The benefits on the postoperative outcomes of early enteral nutrition following major gastrointestinal surgical procedures, including oesophagectomy have been well documented [4, 5]. Therefore, early enteral feeding is currently widely-accepted as a standard of care following major upper gastrointestinal surgery. Additionally; early enteral feeding via jejunostomy-tube has become the preferred nutritional support after oesophagectomy [6]. However, the related jejunostomy-tube complications may cause difficulties in maintaining continuous enteral feeding. Additionally, enteral feeding via jejunostomy-tube was associated with the log-term weight loss that occurred in 20-30% of patients [7, 8]. Recently, the published reports on ERAS program implemented in colorectal and gastric surgery have clearly shown the safety and benefits of early oral feeding on postoperative outcomes including functional and nutritional outcomes, and survival. However, reticence of the surgical community still exists about initiating early oral feeding following oesophagectomy; so, this brief review aims to provide an overview in the light of the recently published reports on the early enteral feeding provided through jejunostomy-tube and oral route after oesophagectomy.

2. Early Enteral Feeding

There is no consensual definition of “early” and “late” feeding, however, early feeding refers to any nutrition started within 24-48h following gastrointestinal surgery. Whereas, delayed

feeding is initiated from 5 days to several weeks postoperatively. Enteral nutrition following oesophagectomy can be provided through direct oral intake or tube feeding

3. Early Enteral Feeding Via Jejunostomy-Tube

Despite the availability of multiple methods for nutritional support after surgery, enteral nutrition via jejunostomy–tube has become the preferred method to provide enteral nutritional support in the immediate postoperative period following oesophagectomy [6, 9]. Despite of the inconsistent definition of early enteral nutrition and the variation in surgical approaches used, the recent published studies on early enteral nutrition via jejunostomy–tubes following oesophagectomy have clearly demonstrated the real benefits of this nutritional method on postoperative outcomes including functional and nutritional outcomes, and survival [10, 19].

Therefore early enteral nutrition via jejunostomy-tube initiated on POD2 was associated with the early return of bowel function, lower stay length and costs compared to delay enteral feeding compared to delayed enteral feeding started on POD3 [20]. Once again, the benefits of early enteral feeding on postoperative outcomes have been supported by published reports in oesophageal surgery.

Early enteral nutrition following oesophagectomy for cancer was associated with educed life-threatening complication rates [21, 22]. In addition, patients who received delayed enteral feeding have had the highest pneumonia incidence with significant worse nutrition parameters [20]. Overall, early enteral nutrition via feeding jejunostomy is safe and widely well-tolerated with decreasing surgical site infection, improving outcome and overall patient survival [4, 23]. However, nutrition via a jejunostomy tube is associated with minor, such as leakage, tube dislocation and obstruction and rare major complications, including intestinal necrosis and torsion torsion that can cause delay or difficulties to maintain prolonged enteral nutrition [9] [24-28].

Enteral nutrition supplementation via feeding jejunostomy does not prevent weight loss. Despite high satisfaction scores and high compliance (96%) and prolonged home enteral nutrition, substantial weight has been reported with enteral nutrition via jejunostomy-tube after oesophagectomy [6, 29]. Reportedly, 70-80% of patients experienced weight loss during the first month after surgery [6, 30], and 10% of the preoperative BMI has been lost six months later in 63.7% of patients [31]. In addition, 27%-95% of them did not return to their baseline weight [6, 30]. Therefore, original disease, especially malignancy and surgical procedure influence significantly the patient nutritional status with independently of the adjustable risk factors. So, adequate postoperative nutrition is primordial to maintain the best nutritional condition with good nutritional parameters.

4. Early Oral Feeding

Despite the safety and documented various advantages of early oral enteral nutrition in many major gastrointestinal surgical procedures, such as colorectal and gastric surgery [32, 33], The hesitance of surgeons to initiate early oral feeding following oesophagectomy is not an evidence-based attitude, but instead based on fears regarding anastomotic leak, pneumonia secondary to aspiration and insufficient nutritional intake with oral feeding [34]. This hesitance in initiating early oral feeding after oesophagectomy has led to limitation of studies on this topic. Recent randomised clinical trials comparing early oral feeding (EOF) alone with jejunostomy-tube feeding or delayed oral feeding following oesophagectomy have been reported. The results showed that early oral feeding alone initiated on POD1 was associated with a short length stay, rapid ROBF and few readmissions without significant increase in complications including anastomotic leak and pneumonia [35, 36, 37]. Whereas, some retrospective studies showed that delayed oral feeding started on POD7 or later following oesophagectomy was associated with significant decrease in anastomotic leakage rates and pulmonary complication incidence compared to early oral feeding [38, 39, 40]. In addition, early oral feeding decreases the stress response after minimally-invasive oesophagectomy [41].

Furthermore, the ERAS program has recently been implemented in oesophageal surgery and early oral feeding is an important component of the ERAS protocols. A meta-analysis including thirteen studies and evaluating the ERAS pathways following oesophagectomy showed a reduced hospital stay length and decreased pulmonary complications without significant increase in readmissions [42].

The most limitations of the studies, including ERAS studies investigating the postoperative early oral feeding following oesophagectomy were the variability in surgical approach (open

vs minimally invasive) and anastomosis location (cervical vs intrathoracic), and as known, cervical anastomosis is more prone to leakage than intrathoracic one. These study limitations might influence the results; however, early oral feeding in the postoperative setting of oesophagectomy seems to be safe and feasible with improved functional and nutritional outcomes.

Despite the showed benefits of early oral feeding following oesophagectomy, the long-term nutritional outcome was associated with weight changes.

As reported by multicenter prospective trial, patients achieved only 58% of the targeted caloric volume with early oral feeding alone initiated on POD1 after minimally invasive oesophagectomy [17]. Independently of the feeding route used, the targeted nutritional volumes are rarely met in the immediate postoperative period following oesophagectomy [43]. In addition, the long-term weight changes were similar in both patients with early and delayed oral feeding after one year, requiring additional nutrition procedures such as prolonged or restarted tube feeding and TPN [44]. However, it is not clear whether oral feeding can really affect the long-term patient nutritional condition, because, the vast majority of patients underwent oesophagectomy, even who were supplemented with tube feeding, develop weight loss at six months after surgery [45].

Overall, published reports focusing on early oral feeding following oesophagectomy are scare with limited sample sizes leading to lack of developing recommendations about the practice of early oral feeding. Therefore, further well designed randomised clinical trials are highly recommended to elaborate recommendations for clinical practice of early oral feeding after oesophagectomy.

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