



# Minimally invasive esophagectomy in elderly patients: is it safe and feasible?

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Although recent advances in multidisciplinary treatment have changed the treatment strategies for esophageal cancer, surgery remains the most effective treatment option in achieving locoregional control. However, esophagectomy remains a highly invasive procedure that can lead to severe postoperative complications. Therefore, minimally invasive esophagectomy (MIE) with a thoracoscopic approach and/or a laparoscopic approach have been recently developed and widely performed worldwide, although there is currently no established evidence supporting the use of MIE as an alternative to open esophagectomy for esophageal cancer (1). In general, more elderly people than younger ones are likely to have underlying medical disorders, and elderly patients with esophageal cancer also have more comorbidities such as cardiovascular and pulmonary diseases, and are at higher risk of postoperative morbidities and mortality. For this reason, elderly patients with esophageal cancer may refrain from surgery and select other treatment options. However, it remains to be analyzed whether age alone is a significant risk factor for esophagectomy including MIE.

In a recent report, Hol *et al.* retrospectively analyzed the data of 187 esophageal cancer patients who underwent MIE between 2014 and 2017, and analyzed the morbidity and mortality after surgery according to the patient's age: 76 years or older (group 1; the eldest elderly) and 71 to 75 years (group 2; younger elderly) (2). There were no significant differences in the clinicopathological characteristics other than age, including the Charlson comorbidity score and tumor stage, between the eldest (n=19) and younger elderly (n=41) patients. There were

no significant differences in length of hospital stay, 90-day morbidity or mortality after MIE (2). Although this study was retrospectively conducted in a single center and the number of eldest elderly patients undergoing MIE for esophageal cancer was not large, the results suggest the feasibility of MIE for elderly patients at risk similar to that of younger patients.

There are several previous studies on the treatment outcomes of esophageal cancer in the elderly, most of which analyzed data on patients undergoing open esophagectomy (3). Although these reports showed esophageal cancer outcomes in the elderly, the definition of elderly patients varied between >65 years and >76 years, in which >70 years was most commonly used to select elderly patients. In this setting, it seems that an open esophagectomy is the mainstay treatment for patients with esophageal cancer, regardless of age, and that the risks should be evaluated individually (3). Regarding MIE in the elderly, a previous study by Baranov *et al.* reported that there were no significant differences in morbidities or short-term mortality and survival between elderly patients  $\geq 75$  years and younger ones <75 years (4). Voncken *et al.* also reported that long-term outcomes for older esophageal cancer patients  $\geq 70$  years selected for treatment with neoadjuvant chemoradiotherapy followed by surgery or definitive chemoradiotherapy were comparable with the outcomes for their younger counterparts (5). The results of the study by Hol *et al.* seem consistent with these previous reports (2).

In western countries, most esophageal cancers are

adenocarcinomas arising from Barrett's esophagus at the esophagogastric junction. In contrast, in the Asia-Pacific region including Japan, the vast majority of esophageal cancers are squamous cell carcinomas arising from the upper to lower thoracic esophagus (6). Because of these differences in the etiologic and epidemiologic background, treatment strategies including the surgical approach for esophageal cancer differ between western countries and the Asia-Pacific region (7). In western countries, a transthoracic esophagectomy is often performed with a two-field lymphadenectomy excluding the upper mediastinal lymph nodes by laparotomy and thoracotomy followed by intrathoracic anastomosis (Ivor-Lewis) or cervical esophagogastric anastomosis (McKeown) (8,9). In contrast, in the Asia-Pacific region, the most popular procedure is a transthoracic esophagectomy with a three- or two-field lymphadenectomy including the upper mediastinal lymph nodes followed by cervical or intrathoracic anastomosis (10). These procedures are also performed as MIE using a thoracoscopic and/or a laparoscopic approach both in western countries and the Asia-Pacific region (11).

Although there are few reports on the outcomes of MIE in elderly patients with esophageal cancer in the Asia-Pacific region, a thoracoscopic esophagectomy may be feasible and surgically safe in elderly patients with low morbidity and mortality, and the most selected treatment strategy for fit healthy elderly patients in clinics appears to be the same as the standard treatment for non-elderly patients (12,13). Future research conducted in multicenter studies or using a national database will hopefully unveil the feasibility of MIE for elderly patients and establish the risk models to predict postoperative outcomes in elderly patients undergoing MIE with a three- or two-field lymphadenectomy for esophageal cancer.

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