Is there a role for radical esophagectomy☆

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Abstract

The aim of primary surgery in the treatment of carcinoma of the esophagus and gastroesophageal junction (GEJ) is definite cure. To obtain this goal R0 resection, i.e. complete macroscopic and microscopic removal is of paramount importance. However, one of the most controversial questions remains the extent of lymph node dissection, in particular the value of cervical lymph node dissection (the so called third field). Three arguments are believed to favour more extended lymphadenectomy: optimal staging, prolonged tumour control, improved cure rate. (a) Optimal staging: available data indicate that unforeseen lymph node involvement in the neck is encountered in approximately 30% of the patients after 3-field lymphadenectomy. Even in tumours of the GEJ up to 20% of the patients in the T3N1 setting have unforeseen positive nodes in the neck. (b) Prolonged tumour control: radical esophagectomy and extensive lymphadenectomy is decreasing locoregional recurrence substantially, below 10%, in several published reports. More over extended lymphadenectomy seems to defer onset of locoregional recurrence and generalised metastasis for up to 3 years or more. (c) Improved cure rate: despite a lack of prospective randomised study many studies indicate a distinct survival benefit after radical esophagectomy and extensive lymphadenectomy. From the available data it becomes clear that radical surgery and extensive lymphadenectomy offers the best chances for prolonged survival or cure. This can be done without increasing hospital mortality and morbidity. Survival figures obtained by this technique are a gold standard to which survival obtained by other techniques (e.g. multimodality treatment forms, VATS resections) have to be compared. © 1999 Elsevier Science B.V. All rights reserved.

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1. Introduction

Carcinoma of the esophagus and gastroesophageal junction (GEJ) are often diagnosed in an advanced stage. As a result the prognosis for these tumours is generally considered to be poor in so far as even justification of surgical treatment has been questioned by some authors [1,2].

Other reasons for this bad reputation are poor general condition, chaotic unpredictable lymphatic spread and multicentric localisation.

Lymph node status however seems to be the most important single prognostic factor with an involvement in 30–80% of reported series [3]. In more than 40% of recurrences, lymph nodes are involved.

As a result two attitudes towards the extent of resection and lymphadenectomy mainly evolved. There are those who believe that lymph node involvement equals, by definition, systemic disease, thus claiming that it is useless to make efforts to perform wide peritumoral resection and lymphadenectomy to improve survival [4]. Others believe that radical en bloc esophagectomy [5] and meticulous extended lymphadenectomy has a beneficial effect on cure rate even in cases with lymph node involvement. The goal of these efforts is to obtain the so called R0 situation (i.e. no residual microscopic tumour) because either microscopic or macroscopic residual tumour leaves the patient with virtually no chance for a cure.

Today there seems to be general agreement that R0 resection, i.e. complete macroscopic and microscopic removal is the basic requirement of any surgical treatment with curative intent for carcinoma of the esophagus and cardia.

Much controversy persists as to the extent of the lymphadenectomy.

Three arguments are believed to favour more extended lymphadenectomy: optimal staging; prolonged tumour control; and improved cure rate.

2. Optimal staging

There is no doubt that lymph node dissection contributes to the accuracy of the final staging. This has been proved most impressively by the results of the 3-field lymphadenectomy as reported especially by the Japanese groups.
Akiyama [6] extensively studied the lymph node metastasis pattern in a series of 200 patients. According to the location of the tumour upper, middle or distal third, cervical lymph node involvement was seen in 46.3, 29.2 and 27%. Involvement of abdominal lymph nodes was 12.2, 39.9 and 74%, respectively. An important conclusion of this study was that involvement of distant lymph nodes is unpredictable regardless of the location of the tumour.

A similar conclusion can be made from a study at our own centre focusing on adenocarcinoma of the distal esophagus and GEJ junction. A meticulous analysis of lymph node involvement in the T3 N1 setting in respectively, 17 patients with distal 1/3 and 20 patients with GEJ tumours were performed.

For distal 1/3 carcinoma, 35.3% of the patients had unforeseen cervical lymph node involvement; in GEJ tumours the incidence was 20% [7].

The consequences of such findings are evident. Extensive lymphadenectomy especially adding the third field to the lymph node dissection increases the accuracy of staging. These data highlight the persisting difficulties in diagnosing positive lymph nodes especially in the neck by clinical staging methods due to the shortcomings of CT, US, EUS. Perhaps in the future positron emission tomography (PET) scan may contribute to improve the detection rate of these nodes.

Finding unforeseen positive nodes questions the interpretations of the accuracy of staging prior to induction treatment modalities. And finally when using chemoradiotherapy as an induction therapy the question arises whether to include also the supraclavicular area and neck into the field to irradiate.

3. Prolonged tumour free survival

A second argument in favour of more extensive surgery is prolonged tumour free survival. From published data there is now overwhelming evidence that R0 resection is the most important prognostic variable after surgery. To obtain this goal organ dissection and lymphadenectomy must be radical.

Hölscher et al. reporting their results on adenocarcinoma had a 5-year survival of 41.4% for R0 and no survival for R1 and R2 resection [8].

In our own experience even in advanced stage III and IV adeno- and squamous cell carcinoma of the esophagus a 20% 5-year survival was obtained for R0 versus no 5-year survival for R1 R2 resections [9].

These results illustrate that apart from a cure, surgery offers the potential of a prolonged disease free survival even in a more advanced stage of the disease. This is probably due to the better locoregional tumour free survival withholding the onset of generalised metastasis

Clark et al. [10] analysing their results of 43 patients who underwent extensive surgery for adenocarcinoma of the lower esophagus and cardia, they found nodal recurrence in 8% of the patients within the area of surgical lymph node dissection.

Altorki in a similar study found a locoregional recurrence in 6% in carcinoma of the esophagus and cardia [11].

In carcinoma of the thoracic esophagus a 5.3% local recurrence rate was reported by Siewert [12] after en bloc esophagectomy and 2-field lymph node dissection. These results compare very favourably with the more than 50% local recurrence rate after transmediastinal blunt dissection as reported by Barbier [13].

In a group of 37 patients who underwent 3-field lymphadenectomy for carcinoma of the thoracic esophagus we found a locoregional recurrence within the operative field in six patients (17.6%). All six patients had at final pathological staging a stage IV T3N1M0 disease with a tumour load of ≥ 5 lymph nodes involved. Half of the recurrences occurred at 3 years or more after surgery which seems to indicate that extended lymphadenectomy seems to defer onset of locoregional recurrence and generalised metastasis.

The final but most important question to be answered is whether more radical dissection really contributes to an improvement of cure rate.

4. Improved cure rate

In 1983 Skinner [5] reported an overall 5-year survival of 22% after en bloc esophagectomy in 92 patients, a survival much better as compared to his historical controls.

Many Japanese groups have been focusing on the impact of cure rate of extensive lymphadenectomy thereby mostly comparing the value of 2-field versus 3-field dissection. They constantly claim an advantage of the 3-field over 2-field lymphadenectomy.

Akiyama [3] reports an overall 53.9% 5-year survival after 3-field versus 37.5% after 2-field dissection. Nabeya [14] obtained a 48% versus 34% for N0 and 34% versus 22% for N1 again comparing 3-field versus 2-field lymphadenectomy.

In the same context Udagawa reports [15] a 5-year survival of 100% versus 59% for stage I, 84% versus 58% for stage II, 32% versus 24% for stage II and finally 25% versus 14% for stage IV disease.

From our earlier published results, in a series of 129 patients with extensive resection and 2-field lymphadenectomy survival rates seem to improve significantly in patients where the operation with curative intention was performed, the 1-year survival being 90.8% versus 72%, 2-year survival 81% versus 46% and 5-year survival 48.5% versus 41% for radical versus non radical resections (P < 0.05) [16].

In a more recent series of 100 consecutive transthoracic resections in our own centre, there seems to be a trend in favour of radical resection in patients with advanced stage IIb -III and IV disease with an estimated 5-year survival of 21% versus 12% for the non radical resection [7].
At this moment there is only one randomised study by Kato [17] comparing 2-field versus 3-field lymphadenectomy.

In this study the 5-year survival after 3-field dissection is 48.7% versus 33.7% in 2-field dissection and survival for stage IV because of cervical lymph node metastasis (M1N3) seems to be better after extended 3-field lymphadenectomy. The major critic of this report were differences in patients characteristics between both groups [18].

This clearly illustrates the need for large randomised prospective studies which remains a very difficult goal to achieve because of the complexity of the disease and the different available surgical techniques.

5. Discussion

As a result when discussing new technologies such as videoendoscopic surgery one must keep in mind that today in many centres with experience in extensive resectional surgery for carcinoma of the esophagus and GE junction cure rates of at least 25% are frequently reported with an hospital mortality rate of less than 5%. These survival figures remain the gold standard to which all other therapeutic regimens need to be compared.

On the other hand because of the morbidity related to radical surgery interest has been generated to perform esophagectomy through a thoracoscopic approach. Video-assisted thoracoscopic surgery (VATS) esophagectomy has been promoted as a minimally invasive alternative to thoracotomy that may decrease the incidence of postoperative pulmonary complications, while facilitating esophageal dissection and lymphadenectomy by providing excellent visualisation of the structures.

A few VATS esophagectomies have been published, the results varying from author to author. This can be explained by the fact that this technique is relatively new and the learning curve is steep and difficult. Generally speaking operating times, length of hospitalisation and length of mechanical ventilation have not been reduced. Moreover the incidence of atelectasis, pleural effusions and pneumonia remains high, usually as high as after transthoracic or transmediastinal approach.

Perioperative complications, despite the magnification by the optical system have been reported, the most common being injury to intercostal and large mediastinal vessels, membranous wall of the airway, thoracic duct and recurrent laryngeal nerve. Of concern are some reports on port site inoculation and unusual early mediastinal recurrences probably related to increased manipulation of the tumour [19].

There is little or no information on survival. Dexter et al. [20] published their results with 25 patients reporting an in hospital mortality of as much as 13% and a 2-year survival of only 33% which is far below the results obtained after extended or en bloc transthoracic esophagectomy which has had a 50–60% 2-year survival being reported frequently, even in stage III disease.

This clearly illustrates that despite a minimal invasive access, this procedure is to be considered as a major intervention requiring an extensive familiarity with conventional esophageal surgical techniques and careful appropriate patient selection.

More recently Akaishi [21] has been focusing on extended lymphadenectomy through VATS. From his experience it seems that a total mediastinal lymphadenectomy including meticulous dissection along the recurrent nerves is technically feasible with a low incidence of morbidity. Although still too early to draw conclusions on survival it seems that survival is matching the survival curves obtained in open surgery.

Further developments are likely to focus now on a complete thoracoscopic and laparoscopic dissection, including tubulisation of the stomach and gastric pull-up into the neck for cervical esophagectomy.

In other words it becomes clear that VATS esophagectomy including extensive lymphadenectomy is technically feasible, a number of surgeons become more and more skilful in using this new technology.

However much work still needs to be done and uncertainty persists about the oncologic results, i.e. the cure rate, port site and locoregional recurrence rate, and perhaps most of all selection of patients as candidates for minimal invasive surgery. The main concern in this respect is that the average surgeon who is less familiar with surgery for carcinoma of the esophagus and GE-junction but who became skilful in using minimal invasive surgical techniques will not resist the temptation to perform esophagectomy through VATS omitting the essential principles and guidelines of surgical oncology and jeopardising the chances of cure in a number of patients. Therefore all efforts should be made to restrict VATS esophagectomy for cancer to those centres with more experience in open surgery and with sufficient expertise in minimal invasive surgery and also to try to develop safe oncologic strategies and techniques guaranteeing at least equal and preferably better results than the gold standard obtained in open surgery.

References


