KEY ISSUES IN THE SURGICAL MANAGEMENT OF MALIGNANT PLEURAL MESOTHELIOMA

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The areas for discussion are as follows:

Extrapleural pneumonectomy (EPP) or Pleurectomy/decortication ?

Survival has not been shown to be compromised by sparing the lung. Indeed, the increased early mortality and longer-term morbidity of EPP suggest that PD should be preserved. Those who argue that sometimes EPP is necessary to remove severely invasive disease, or a destroyed lung should consider whether surgery is justified at all in these advanced cases.

What should be the intention of Pleurectomy/decortication ?

It is agreed that the best a surgeon can hope for in surgery for MPM is an R1 resection achieving a macroscopic complete resection (MCR) only. An R2 resection leaving visible disease should be avoided. For many EPP was viewed as the radical option for MPM whilst PD was viewed as a palliative alternative reserved for those less fit and intended to relieve symptoms by re-expanding the trapped lung. In fact PD can be just as radical as EPP in removing all macroscopic tumour and should be thought of as a radical operation for cancer control and prolongation of survival.

Should we preserve the diaphragm ?

Excision of the diaphragm (phrenectomy) is undoubtedly a morbid procedure which adversely affects postoperative lung function and introduces the risks of prosthetic complications. Surgeons may therefore be tempted to leave an abnormal diaphragm and accept an R2 resection. We have found that this situation is the worst of both worlds leaving the patient with the morbidity of a major resection without any survival benefit. However, we have moved towards preservation of the diaphragm wherever possible as this improves postoperative air leak and reduces postoperative stay.

How should we manage the visceral pleurectomy ?

If one accepts that the intention of PD is to achieve MCR then all abnormal visceral pleura should be removed. There are three potential problems : 1. It is difficult to assess the visceral pleura in early disease to determine what is visible or viable tumour ; 2. It is difficult to do and 3. runs the risk of a prolonged postoperative air leak. There is no substitute for meticulous (time-consuming) sharp and blunt dissection facilitated by intraoperative ventilation in order to remove as much visceral pleura as possible (irrespective of its appearance).

What lymph node dissection is required?
There are no clear international guidelines on the technique of lymph node dissection for MPM so we recommend the same technique as for lung cancer together with dissection of the additional stations not commonly involved in lung cancer: internal mammary, pericardial, diaphragmatic and where visible intercostal nodes. There is a need for a standardized approach to intraoperative staging.

Should we be operating at all?
The results of the MARS2 trial will not be reported until late 2022 or early 2023.
In the interim we have agreed to continue to operate on those with the best prognosis: epithelioid cell type with no nodal metastases in conjunction with systemic therapy. The timing of surgery in relation to chemotherapy remains debatable. Oncologists are concerned that patients will not be fit enough after PD to complete chemotherapy whilst surgeons are concerned that tumour progression on chemotherapy may prevent preservation of the diaphragm. At present I have adopted a protocol similar to lung cancer where those with stage I disease receive upfront surgery whilst more advance disease is given induction chemotherapy with restaging.

References

1. *Lim E, Mesothelioma and Radical Surgery 2 (MARS 2): protocol for a multicentre randomised trial comparing (extended) pleurectomy decortication versus no (extended) pleurectomy decortication for patients with malignant pleural mesothelioma. BMJ Open. 2020 Sep 1;10(9):e038892.*
2. *Waller DA, Divided by an ocean of water but united in an ocean of uncertainty: A transatlantic review of mesothelioma surgery guidelines. J Thorac Cardiovasc Surg. 2021 Jun;161(6):1922-1925.*
3. *Friedberg JS, A Proposed System Toward Standardizing Surgical-Based Treatments for Malignant Pleural Mesothelioma, From the Joint National Cancer Institute-International Association for the Study of Lung Cancer-Mesothelioma Applied Research Foundation Taskforce. J Thorac Oncol. 2019 Aug;14(8):1343-1353.*
4. *Flores RM, Extrapleural pneumonectomy versus pleurectomy/decortication in the surgical management of malignant pleural mesothelioma: results in 663 patients. J Thorac Cardiovasc Surg. 2008 Mar;135(3):620-6, 626.e1-3.*
5. *Sugarbaker DJ. Macroscopic complete resection: the goal of primary surgery in multimodality therapy for pleural mesothelioma. J Thorac Oncol. 2006 Feb;1(2):175-6.*

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