Can Maximally Invasive Surgery Be Minimized?

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Patients with malignant pleural mesothelioma (MPM) have a maximally invasive disease that requires intensive therapy to improve outcomes. Dr Hasegawa et al should be commended for presenting a large series of patients with excellent outcomes and reporting the evolution of their surgical approach over 12 years. While they present a "less invasive surgery" for MPM, the "less" is relative to one of the most invasive operations in thoracic surgery. Even in their experienced hands, the operation remains major undertaking.

Both extrapleural pneumonectomies (EPP) and pleurectomy and decortication (PD) are technically demanding operations requiring multiple steps and extended thoracotomies. Starting in 2009 after 26 of the 60 EPP in this series, the authors stopped dividing the anterior costal arch and moved the thoracotomy from the fifth to the seventh rib space. According to the consensus report of the International Association for the Study of Lung Cancer (IASLC), EPP is defined as the en bloc resection of visceral and parietal pleura with the ipsilateral lung, diaphragm, and pericardium.[1] Therefore, both of the author's approaches for an EPP are a standard EPP and are not truly less invasive. Additionally, they used a thoracoscope to help with apex and costophrenic angle visualization. While the use of the thoracoscope is a great adjunct technique, I would not recommend using the terminology, "video-assisted thoracoscopic surgery (VATS)." Although semantically correct, I would contend that VATS connotes a minimally invasive thoracic operation which this operation is not. Another noteworthy technical point: the authors selectively resected the diaphragm and pericardium only when involved with disease. We routinely receive pathologic reports that state "no invasion of diaphragmatic muscle" and I agree that when the tumor is not grossly adherent to these structures, they do not need to be resected or they only need to be partially resected. As they note, management of the residual thoracic space is easier without prosthetic material especially when a patient has a prolonged air leak after a PD. Regardless of terminology, the authors reported several noteworthy changes that helped improve their operation.

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Central Message

Patients with malignant pleural mesothelioma (MPM) have a maximally invasive disease that requires intensive therapy to improve patient's outcomes.

Multimodality therapy is recommended for appropriately selected patients, yet the sequence is debatable. The American Society of Clinical Oncology Clinical Practice Guidelines strongly recommends antineoplastic treatment in addition to surgery.[2] However, they do not state whether neoadjuvant or adjuvant therapy should be administered except when transdiaphragmatic disease, multifocal chest wall invasion, or contralateral nodal disease is present. In these situations, they recommend neoadjuvant therapy prior to considering cytoreductive surgery. The authors utilize the neoadjuvant approach to multimodality therapy. In this series, 83% (124/149) of patients who received neoadjuvant chemotherapy underwent surgery which is a relatively high percentage. The regimen is mainly cisplatin and pemetrexed; therefore, the numbers are likely comparable to other institutions. Among these patients, only 8% (10/127) underwent exploratory thoracotomy, which is a testament to the authors' ability to select the appropriate patients for multimodality therapy and to perform this operation well. The concern with neoadjuvant chemotherapy is that patients who do not respond to chemotherapy may lose the window of resectability. The counterpoint is that patients who progress are unlikely to have benefited from surgery and may be spared an unnecessary operation. Our practice is to routinely perform mediastinoscopy and a diagnostic laparoscopy. If the nodes are positive or the diagnostic laparoscopy reveals disease, we recommend neoadjuvant therapy. If negative, we proceed to surgery. Given that guidelines did not recommend

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one approach over the other for earlier stage disease, variability is common between centers but the authors' numbers help counsel patients on the likelihood of proceeding to surgery after neoadjuvant therapy.

In this series, the median survival of all patients who underwent surgical resection was 43.4 months. They did not report the survival by stage, but most patients had preoperative stage II or II disease. IASLC Mesothelioma Staging Project reported median survivals of 22 and 16 months for stage II and III disease, respectively.[3] Despite the inability to compare directly, these results are substantially better than expected. The exclusion of patients who progressed on neoadjuvant therapy and of those who underwent exploratory thoracotomy may explain these particularly favorable survivals. Even with a selection bias toward favorable patients, the authors have excellent results for a particularly difficult disease and operation.

With results that are at least as good if not better than many series, the authors should be commended for tracking their data and re-evaluating their approach. Following their own outcomes and changing their operation may have been critical to improving their excellent surgical outcomes.

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