Pleurodesis as a treatment option for unresectable malignant mesothelioma

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Background

Systemic therapy is the treatment of choice for patients with advanced malignant mesothelioma (MM). However, non-surgical options can also play a role to control symptoms. Here, we present a case of a patient with advanced MM treated predominantly with pleurodesis.

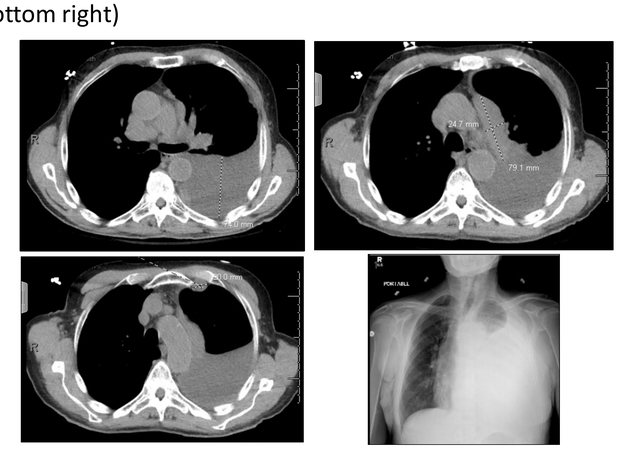
Nonsurgical Options:
- Pleurodesis
- Tunneled catheters
- VATS pleurectomy

Systemic Therapy:
- Nivolumab + ipililumab (most effective combination)

Case Presentation

- 82-year-old male with hypertension and benign prostatic hyperplasia presented with dyspnea increasing with exertion for one month making it more difficult to perform daily life activities.
- Denies chest pain and cough. Endorses 5lb weight loss over period of 6 months. Reports he was sent to the ER for a "pericardial effusion" for which an echocardiogram and chest x-ray were performed, and he was found to have a large left-sided pleural effusion.
- 5 pack-year history but denies current tobacco use. Denies alcohol and illicit drug use.

Imaging
- C/A/P CT highly suggestive of malignant mesothelioma, likely stage III disease. Imaging revealed the following:
  - Large left pleural effusion measuring 7.4 cm in AP diameter with compressive atelectasis (**Figure 1**; top left)
  - Left suprahilar consolidation measuring 2.5 x 8 x 5.1 cm concerning for mass (**Figure 2**; top right)
  - Left upper lobe lesion measuring 2 cm suggestive of loculated pleural fluid (**Figure 3**; bottom left)
- Initial chest x-ray exhibiting large left pleural effusion (**Figure 4**; bottom right)



Management

1) US-guided thoracentesis
- ▻ Removed 1.5 L of amber fluid consistent with exudate → improved dyspnea and relieving pain
- ▻ No malignant cells found
- ▻ Pleural fluid reaccumulated 2 weeks later (**Figure 6**)

2) Bronchoscopy & Thoracoscopy with talc pleurodesis and biopsy
- ▻ 4250 mL of fluid were removed and diffuse carcinomatosis of the parietal pleural space was found
- ▻ Pathology findings consistent with malignant pleural mesothelioma
- ▻ Circulating tumor DNA on liquid biopsy detected a VUS mutation in mTOR; TMB was not evaluable and high MSI was not detected

3) Monitor patient until clinical or radiologic progression

4) 5 months later, C/A/P CT exhibited an increase in the size of the left pleural-based masses, but patient remained asymptomatic
- ▻No distant metastases visualized on the scan

5) Initiated systemic treatment with ipilumab and nivolumab, but discontinued 1 week later due to immunotherapy-related complications: diabetic ketoacidosis and severe debilitating inflammatory arthritis

6) Patient recovered from immunotherapy-related complications and was asymptomatic

7) 6 months later, patient developed worsening shortness of breath and scans showed progression including an increase in mediastinal masses and metastatic pulmonary nodules

8) Reintroduced Nivolumab monotherapy

9) Rapid clinical and radiologic progression leading to patient expiration

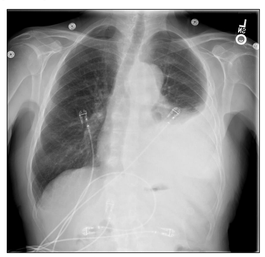


Figure 5: Chest x-ray exhibiting decrease in size of left-sided pleural effusion following US-guided thoracentesis.

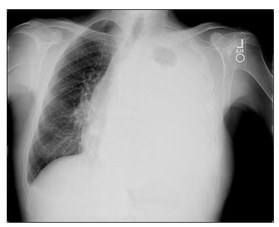


Figure 6: Chest x-ray revealing re-accumulation of pleural fluid within left lung.

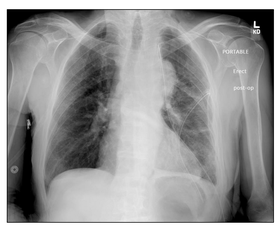


Figure 7: Chest x-ray post bronchoscopy and thoracoscopy with talc pleurodesis showing resolution of left-sided pleural effusion.

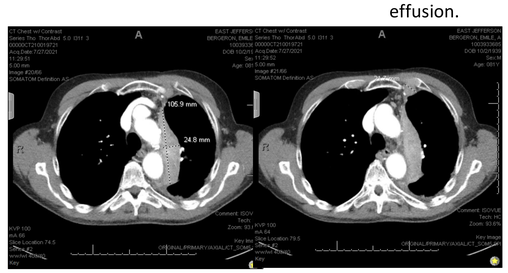
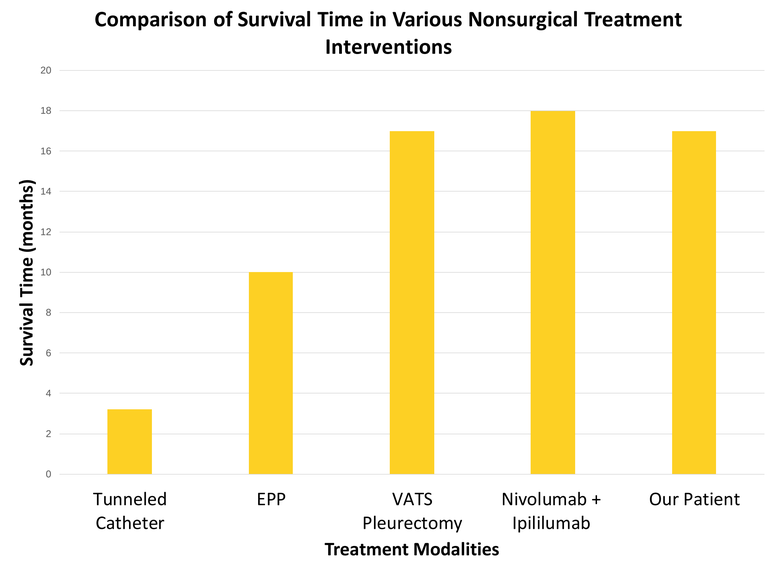


Figure 8: Axial chest CT scan demonstrating progression of disease due enlargement of the suprahilar mass from 2.5 x 8 x 5.1 cm to 2.5 x 10 cm (left) and enlargement of the left upper lobe lesion from 2cm to 2.1 cm (right).

Conclusions

This case highlights the consideration of pleurodesis as initial palliative therapy in patients with recurrent malignant pleural effusions. As illustrated in this case, systemic therapy can be associated with significant toxicity which can be spared or delayed by pleurodesis. NCCN guidelines describe observation as a treatment option for patients who are asymptomatic and systemic therapy at the time of progression. The survival of our patient treated primarily with a pleurodesis was comparable to survival reported with systemic therapy and longer than other nonsurgical interventions.



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