We experienced a case of massive mediastinal liposarcoma expanding to the bilateral pleural cavities. Preoperative positron emission tomography-computed tomography scan showed that the uptake of $^{18}$F-fluorodeoxyglucose (FDG) into the tumor was slight for its size. Clamshell incision together with lower median sternotomy provided the excellent visualization and the complete resection of the tumor. The surgical resection should be performed even for a massive liposarcoma, especially if the uptake of F-FDG into the tumor is low, as complete surgical resection is the only definitive treatment for liposarcoma.

Keywords: mediastinal liposarcoma, clamshell incision, lower median sternotomy, positron emission tomography-computed tomography
Surgical Resection of a Mediastinal Liposarcoma

only in a solid component of the tumor [maximum standardized uptake value (SUVmax) = 2.34], implying that this tumor was less invasive for its size (Fig. 1D and 1E). CT-guided needle biopsy was performed and pathological diagnosis was a well-differentiated liposarcoma. Surgical resection was first performed by clamshell incision and lower median sternotomy was added so as to resect the lesion on the diaphragm easily, without an additional skin incision (Fig. 2). By this procedure, excellent visualization and the en bloc complete resection of the tumor were accomplished. There was no invasion of the tumor into the bilateral lungs, chest wall, diaphragm or pericardium. The tumor weighed 1200g with the dimension of 31 cm × 18 cm × 12 cm (Fig. 3A). The pathological findings of the tumor revealed that adipocytes were proliferated with variation in their size and stromal cells with cellular atypia and hyperchromatism...
were scattered, suggesting the common findings of well-differentiated liposarcoma. The tumor was encapsulated with negative surgical margin (Fig. 3B). The postoperative course was uneventful. The patient was discharged on the 10th postoperative day. She is currently alive 7 months after the surgery. She has not been monitored for relapse sufficiently yet, as she had been in the local hospital because of the exacerbation of schizophrenic disorder for 5 months and was discharged recently.

Discussion and Conclusion

 Mediastinal tumors often grow rapidly and several surgical approaches should be considered. Median sternotomy is a common procedure for resecting a mediastinal tumor. However, it may not afford adequate exposure to the mediastinal tumors that extend into a thoracic cavity. Clamshell incisions are used for the resecting bilateral pulmonary metastasis and large mediastinal tumors as well as for bilateral lung transplantation. In this case, we selected clamshell incision combined with lower sternotomy, because only clamshell approach did not confer the excellent visualization for the lesion on the diaphragm. Lower median sternotomy without additional skin incision provided the complete resection of the tumor. Of note, an appropriate operative field is extremely important, because liposarcomas often have ill-defined borders, that is, liposarcomas contain much amount of adipose-like tissue and it is sometimes difficult to distinguish a tumor-derived adipose-like tissue from a normal adipose tissue. This fact is consistent with the previous reports that liposarcomas tend to result in a local recurrence even if they were well-differentiated tumors. 

Brenner and colleagues reported the relationship between the histological subtypes of liposarcoma and the SUV$_{\text{max}}$ on PET-CT scan. Significant differences were found for SUV$_{\text{max}}$ among tumor subtypes, and well-differentiated liposarcoma showed a significantly lower SUV$_{\text{max}}$ ($2.3 \pm 1.7$) than myxoid/round cell and pleomorphic subtypes. In the present case, SUV$_{\text{max}}$ was 2.34, which was concordant with this report. They also described that the patients with a SUV$_{\text{max}}$ $\leq 3.6$ had a significantly longer disease-free survival in Kaplan-Meier survival analysis. Considering the fact that chemotherapy and radiotherapy are both ineffective for liposarcomas, surgical procedure should be performed for liposarcoma, especially for the one with lower SUV$_{\text{max}}$.

In conclusion, we experienced a case of massive mediastinal liposarcoma expanding to the bilateral pleural cavities, which resulted in the successful resection by clamshell incision combined with lower median sternotomy. As surgical resection is the only definitive treatment for liposarcomas, it should be performed even if the tumor is extremely massive, especially if the uptake of FDG into the tumor on PET-CT scan is slight.

Disclosure Statement

None of the authors has any financial or other potential conflicts of interest.

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