

Salvage Surgery for Pancoast Tumor with Vertebral Invasion

Vertebra İnvazyonuna Neden olan Pancoast Tümöründe Kurtarma Cerrahisi

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ABSTRACT

Surgical treatment in patients with non-small cell lung cancer with vertebral invasion is controversial. Current studies have shown that, the multimodal therapy (induction chemo-radiotherapy, surgery) has acceptable morbidity and mortality in selected patients. There is no common consensus for performing surgery after curative intent chemoradiotherapy. Here we presented a multimodal therapy for a patient with pancoast tumor invading vertebrae. A 51-year-old male patient has a 10x7 cm, non-small cell lung cancer diagnosed lesion in the apical of left lung with pathological involvement in PET / CT. After curative-intent chemo-radiotherapy, the patient underwent enblock left 1-3rd rib resection, 4th rib partial resection with left upper lobectomy and mediastinal lymph node dissection, C7 partial excision and T1-3 hemivertebrectomy as a salvage surgery. No complication was observed in the postoperative period.

Key Words: Chemo-radiotherapy, lung cancer, salvage surgery, vertebral invasion

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ÖZET

Vertebral invazyonu olan küçük hücreli dışı akciğer kanserli hastalarda cerrahi tedavi tartışmalı bir durumdur. Güncel çalışmalar, multimodal tedavinin (indüksiyon kemoradyoterapi, cerrahi) seçilmiş hastalarda kabul edilebilir morbidite ve mortaliteye sahip olduğunu göstermiştir. Definitif kemoradyoterapi sonrası yapılacak cerrahi için uzlaşmış bir karar yoktur. Burada vertebral invazyona yol açan pancoast tümürlü bir hastaya uygulanan multi-modal tedaviyi sunmayı amaçladık. 51 yaşında erkek, sol akciğer apikalde 10x7 cm'lik, PET/BT'de patolojik tutulum gösteren küçük hücreli dışı akciğer kanseri tanılı lezyonu olan hastaya, kemoradyoterapi sonrası, sol üst lobektomi ve mediastinal lenf nodu diseksiyonu ile birlikte enblok sol 1-3. kot rezeksiyonu, sol 4.kot parsiyel rezeksiyonu, C7 parsiyel eksizyonu ve T1-3 hemivertebrektomi yapıldı. Postoperatif dönemde herhangi bir sorun izlenmedi.

Anahtar Sözcükler: Akciğer kanseri, kemoradyoterapi, kurtarma cerrahisi, vertebral invazyon.

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INTRODUCTION

Surgical treatment in patients with non-small cell lung cancer with vertebral invasion is controversial. New advances in surgery and recent studies, these patients are no longer considered inoperable and selected patients are operated in experienced centers (1,2). There are studies indicating that 3-year survival is between 58-68% after enblock surgery (2,3). Similarly, in recent years, the salvage surgery has been reported in patients undergoing chemo-radiotherapy with curative intent. In this article, we wanted to share a case we performed salvage surgery owing to the failure of treatment in a patient who underwent curative chemo-radiotherapy due to local advanced lung disease (vertebral invasion and ipsilateral lymph node involvement).

CASE REPORT

A 51-year-old male patient was evaluated at another health center with complaint of left arm pain. In the apical segment of left upper lobe, involving left 1-3rd rib, size of 10x7 cm lesion was detected in thorax CT extending towards the spinal canal, causing destruction in the ribs and in the left half of the T1-3 vertebrae. Pathological increased uptake of the 18F-FDG was detected in the PET-CT (SUVmax: 14.1, Figure 1). The histopathologic result of the mass obtained by transthoracic tru-cut biopsy was reported as non-small cell lung cancer.

Pre-treatment TNM staging was evaluated as T4N2M0 with single station mediastinal lymph node involvement (Stage IIB) and the patient received definitive chemo-radiotherapy (30 days-60 Gy radiotherapy and 6 cycles of platinum-based chemotherapy, cisplatin-gemcitabine combination). PET-CT and EBUS were used for re-evaluate whether there was mediastinal lymph node invasion. Mediastinoscopy was not considered for the patient received definitive radiotherapy. A decrease in metabolic activity and size of mass (7x5 cm; SUVmax: 3.6) was detected in the PET-CT taken 6 weeks later of chemoradiotherapy (Figure 2). The rTNM staging of the patient was evaluated as T3N0M0 (Stage IIB). The patient underwent enblock left 1-3rd rib resection, 4th rib partial resection with left upper lobectomy and mediastinal lymph node dissection via Shaw-Paulson incision. In addition the tumor was adjacent to subclavian artery and was detached from vascular adventitia. In the same session, C7-T1 nerve roots of brachial plexus were divided, partial excision of C7 vertebra and T1-3 hemivertebrectomy for T1-T3 vertebrae with vertebral instrumentation were performed without additional incision. Thus, the tumor was removed as R0 resection. In the postoperative follow-up, airway secretions of the patient increased and the pneumonic infiltration on chest X-ray was detected. But any microorganism could not be isolated in sputum culture. However, the patient was accepted as a hospital-acquired infection. Clinical and radiological recovery was observed with empirical- broad spectrum antibiotic therapy. He was discharged on the 18th day. Our patient is on the 9th month of follow-up with uneventfully (Figure 3).

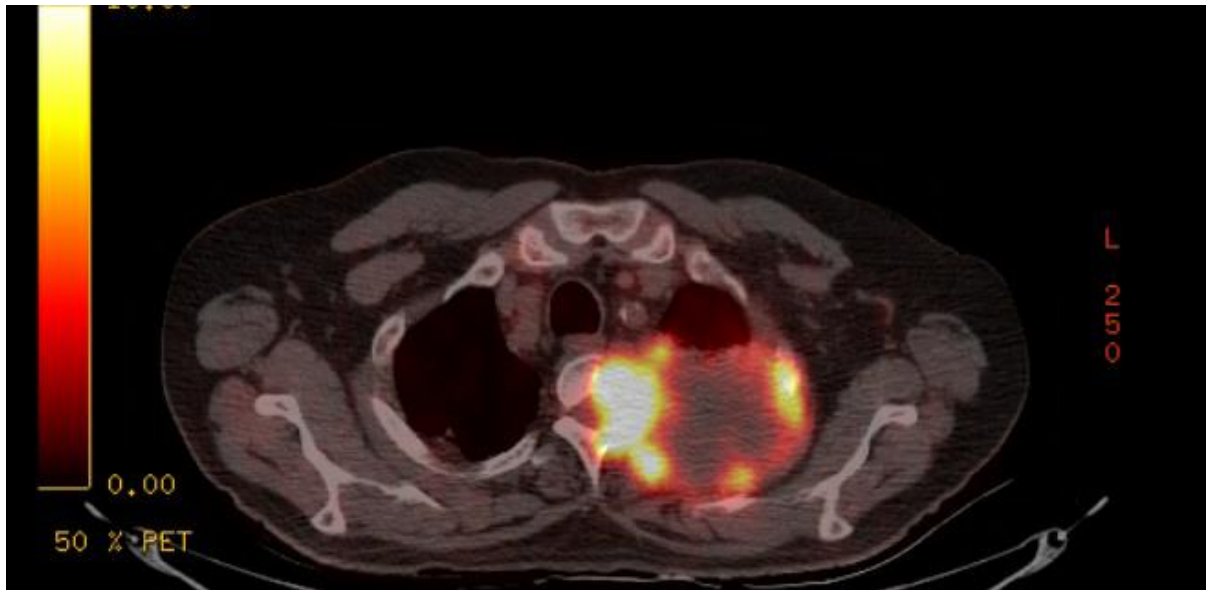


Figure 1: The first PET-CT scan of patient is seen. A mass involving left 1st to 3rd rib was detected in the apical segment of left upper lobe with 10 cm diameter. The tumor extends towards the spinal canal, destroys the ribs and in the left half of the T1-3 vertebrae (SUVmax: 14.1).

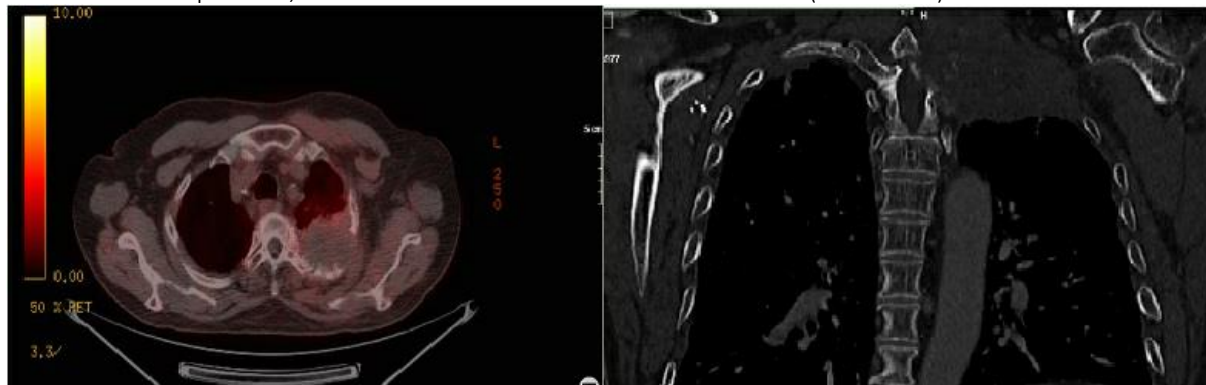


Figure 2: A decrease in terms of metabolic activity and diameter of tumor was detected on PET-CT taken after the chemo-radiotherapy. PET/BT axial and thorax CT coronal section image after chemo-radiotherapy.



Figure 3: Postoperative 3rd month follow-up chest X-ray.

DISCUSSION

We presented a case of vertebrae invading pancoast tumor successfully treated by multi-modal therapy. Aggressive surgical treatments provided R0 resection of lung cancer with vertebral invasion may affect to survival positively. By force of induction chemo-radiotherapy, complete resection rates are increasing and there are many publications where this rate varies between 16.7-43% (2). In a study conducted by Fadel et al., 50% of patients who were given preoperative chemo-radiotherapy did not have postoperative mortality and morbidity (3). When curative chemo-radiotherapy was given without surgery in T4N0 / N1 patients, the mean survival was 20 months; 3-year survival was reported as 22%; however, if the surgery was added to treatment, a mean survival was 47 months and 3-year survival was reported as 54% (4). Contrary to what is thought, local failure of treatment after definitive chemo-radiotherapy is a common condition in patients with locally advanced non-small cell lung cancer, associated with the rate of 39% in 2 years. In the circumstances, the salvage surgery is a feasible option considering the failure of second-line chemotherapy to provide adequate disease-free survival rates and re-irradiation side effects. However, worldwide experience and data on this subject are rare and new (5).

In a retrospective study by Anraku et al. including 23 patients underwent radical vertebral surgery, a 3-year survival was reported as 58%, and it was stated that complete resection was achieved in 19 patients and the authors claimed the fact of superiority of surgery to radiotherapy in the case of vertebral invasion (4).

In another study conducted by Schirren et al., mean survival was 14.2 months in patients considered inoperable and given curative chemo-radiotherapy only, whereas it was stated as 46 months in patients undergoing surgery. 5-year survival in this surgical group is 47% (2). In many publications, the poor prognostic factors were reported as follows; incomplete resection, sublobar resection and old age (1).

Schirren et al. recommended additional stabilization of vertebra in the case of hemivertebrectomy of more than 4 levels, resection of erector spinae muscle of more than 2 vertebral bodies and severe osteoporosis (2). Similarly, in our case, partial resection at the level of C7 and T1-T3 hemivertebrectomy and instrumentation of vertebra with cage were performed. Although our patient had high-dose radiotherapy, early complications related instrumentation did not develop.

A case series with 23 patients conducted by Anraku et al., 48% of patients had at least one major complication such as pneumonia / respiratory failure, vocal cord paralysis and bronchopleural fistula (4).

Although major complications such as major hemorrhages requiring rethoracotomy and laryngeal recurrent nerve injury were not experienced in our case, mild respiratory failure without severe hypoxia due to pneumonia was occurred.

On the other hand, although complication rates seem to be higher after salvage surgery, they are within acceptable limits. Complications are similar to those seen after induction therapy. In the study of Schreiner et al., morbidity was reported as 38%, and a 30-day mortality rate was 7.7% (5). Kaba et al. reported the morbidity and mortality rates after salvage surgery as 70% and 3%, respectively (6). Wound infection, pneumonia, bronchopleural fistula, laryngeal nerve palsy, empyema, ARDS and multiorgan failure have been reported as the most common complications.

CONCLUSION

In selected non-small cell lung cancer patients with vertebral invasion, enblock resection after curative intent chemo-radiotherapy is a safe treatment option as a salvage surgery with acceptable morbidity in experienced centers.

Conflict of interest

No conflict of interest was declared by the authors.

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