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ÖNSÖZ

Göğüs cerrahisi zaman içerisinde hızla kendini yenileyen ve gelişime oldukça açık bir bölümdür. Buradan yola çıkarak dünyadaki güncel gelişmeler ışığında güncel konular farklı bakış açısı ile ele alınmış bir kitap oluşturulmuş siz değerli okurlarımızın beğenisine sunulmuştur. " GÜNCEL TEMEL VE KLİNİK GÖĞÜS CERRAHİSİ" adlı kitap, kalp damar alanına giriş yapacak okuyucular için kapsamlı bir bilgi sunmaktadır. Bu nedenle kitabın bu alanda gelişecek olan meslektaşlarımıza kaynak olarak faydalı olacağını ummaktayız. Kitabımızda emeği geçen yazarlarımıza teşekkür ediyor, her türlü desteği veren BİDGE YAYINLARI yayınevine şükranlarımızı sunuyoruz.

Editör

PROF.DR. AYKUT ELİÇORA

İÇİNDEKİLER

BÖLÜM 1

BİR GÖĞÜS CERRAHİSİ ACİLİ: TANSİYON PNÖMOTORAKS

SUZAN TEMİZ BEKCE[1]

Giriş

Tansiyon pnömotoraksın (TP) patofizyolojisinde tek yönlü valv mekanizmasının sorumlu olduğu ileri sürülmüştür (Leigh-Smith S & Harris T, 2005:8; Watts BL & Howell MA, 2001:319). Bu mekanizmada, inspirasyon sırasında visseral plevradaki bir defektten plevral boşluğa hava girişi meydana gelirken, ekspirasyonda bu havanın dışarı çıkışı engellenir. Bunun sonucunda plevral boşlukta basıncın giderek artmasıyla ipsilateral akciğer parankiminin yeterince genişlemesi engellenir. Bu durum, mediastenin itilmesine, kardiyovasküler kollapsa, hipotansiyona ve mortaliteye neden olabilir.

TP hayatı tehdit eden bir klinik tablodur. Hemodinamik instabilite gelişmeden önce erken tanı ve hızlı müdahale hasta prognozu açısından belirleyicidir.

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TP'nin erken tanı ve tedavisiyle mortalite oranı %3 ila %7 arasında değişirken, tanıda gecikme durumunda bu oran %31 ila %91'e kadar yükselebilmektedir (Chen KY & ark., 2002:678; Yoon JS & ark., 2013: 197).

Pnömotoraks olgularında en sık başvuru nedenleri göğüs ağrısı ve dispnedir (Zarogoulidis P & ark., 2014:372). Ancak pnömotoraksın boyutuna bağlı olarak asemptomatik olgular da görülebilmektedir. TP klinik tablosu sendromik özellikler taşımaktadır (American College of Surgeons, 2013:1363; Leigh-Smith S & Davies G, 2007:1403). Ani gelişen hipotansiyon, takipne, taşikardi, ve siyanoz bulgusu TP açısından yüksek riskli durumlara işaret eder. Bunlara ek olarak ajitasyon, bilinç durumunda değişiklik ve periferik perfüzyon bozukluğu gibi bulgular da gözlenebilir. Juguler venöz dolgunluk ve trakeal deviasyon ise genellikle geç dönemde gözlenmektedir (National Association of Emergency Medical Technicians 8th ed., 2014:334).

Fizik muayenede TP'nin olduğu tarafta solunum seslerinde azalma veya yokluğu, taktil fremitusta azalma, perküsyonda hiperrezonans ve toraks ekspansiyonunda asimetri gibi bulgular gözlenir. Tanıyı desteklemek amacıyla sıklıkla ilk seçenek olarak kullanılan akciğer grafisinde; mediastinal şift, parankim kollapsı ve diyaframın düzleşmesi gibi radyolojik bulgular saptanabilir.

Mekanik ventilasyon desteği altındaki yoğun bakım hastalarında, pnömotoraksın TP'a dönüşme oranının yüksek olduğu bildirilmiştir (Steier M & ark., 1974:17; Kollef MH, 1991:906). Bu hasta grubunda klinik şüphe mevcutsa, görüntüleme beklenmeksizin acil girişim yapılması hayati önem taşımaktadr. Literatürde bu durum "*asla çekilmemesi gereken göğüs radyografisi*" kavramı ile tanımlanmakta ve hızlı müdahalenin önemi vurgulanmaktadır (Barton ED, 1999:269; Light RW, 1994:468; Baumann MH & Sahn SA, 1993:177).

Torasik ultrasonagrafi; hasta başında uygulanabilirliği, hızlı değerlendirme ve hızlı tanı koyma imkanı sunması nedeniyle sıklıkla kullanılan bir yöntemdir. Pnömotoraks olgularının ultrasonagrafi ile değerlendirildiği sistemetik meta-analiz çalışmasında; subkutan amfizemlerin görüldüğü olgularda, artefaktlar nedeniyle görüntü kalitesinin olumsuz etkilendiği ve değerlendirmeyi zorlaştırabileceği yayınlanmıştır (Gentry Wilkerson R & Stone MB, 2010:11).

Gereksiz invaziv işlemleri önlemek, uygun tedavinin hızla başlanabilmesini sağlanması açısından TP ayırıcı tanısında: pulmoner emboli, akut koroner sendrom, akut aort diseksiyonu, miyokard enfarktüsü, pnömoni, akut perikardit, kot fraktürü ve diyafram yaralanmaları göz önünde bulundurulması kritik öneme sahiptir (Sahota RJ & Sayad E, 2025).

TP olgularında tanı radyografi ile konulamazsa, Bilgisayarlı toraks tomografisi yüksek doğruluk sağlasa da, acil müdahale gerekliliği nedeniyle bu yöntemin rutin kullanımı önerilmemektedir (Sahota RJ & Sayad E, 2025).

Tedavi Yaklaşımı

Resüsitasyon kılavuzlarında geriye döndürülebilir kardiyak arrest nedenlerinden biri TP olup intratorasik basınç azaltılmadığı sürece kardiyopulmoner resüsitasyonun etkisiz kalacağı vurgulanmaktadır (Kleber C & ark., 2014:405; Lockey DJ, Lyon RM & Davies GE, 2013:738; Rajan JN & de Mello WF, 2012:1230; Lockey D & ark., 2008: 738; Mistry N, Bleetman A & Roberts KJ, 2009:738; Sherren PB & ark., 2013:308)

Bu durum, tanı ve tedavi zamanlamasının hastanın prognozu üzerinde belirleyici bir etkisi olduğunu ortaya koymaktadır. Hastalar yakından monitorize edilmeli ve bu süreçte oksijen desteği sağlanmalıdır. Entübe edilen olgularda ise, mekanik ventilasyon stratejisi tansiyon pnömotoraksın fizyopatolojisine uygun olarak titizlikle düzenlenmelidir. Yüksek havayolu basınçları intratorasik basıncı artırarak klinik durumu kötüleştirebileceğinden, düşük tidal volüm, düşük inspiratuar basınç, minimal pozitif end-ekspiratuar basınç (PEEP) ve uzatılmış ekspiratuar süre gibi parametrelerle ventilasyonun optimize edilmesi önerilmektedir (Kirkpatrick & ark., 2008:310; American College of Surgeons, 10th ed., 2018).

Travma hastalarının takibinde TP şüphesi varlığında; hastane dışında tüp torakostomi uygulanmalarının tartışmaları sürmektedir. Hastane öncesi değerlendirmenin dahil olduğu birçok ortamda, acil göğüs dekompresyonu gerektiği durumlarda iğne torakostominin plevral boşluğa erişimin en hızlı yolu olduğu belirtilmiştir (National Association of Emergency Medical Technicians 8th ed., 2014:334; Leigh-Smith S & Harris T, 2005:8). Başka bir çalışmada bu görüşe destek olarak; tüp torakostomi yapılana kadar, hemodinamik stabiliteyi korumak için iğne veya kanülün yerinde bırakılmasını önermektedir (Zarogoulidis P & ark., 2014:372).

Hava ambulansı tıbbi personel ekipleriyle yapılan çalışmada; TP olgularında tüp torakostomi uygulanana kadar, hastaların %38 inde iğne dekomresyonunun başarısız olduğu bildirilmiştir (Barton ED & ark., 1995:155). İğne ile torakostomi uygulanan 84 olgunun incelendiği retrospektif başka bir çalışmada, yalnızca %27,4 oranında plevral boşluğa uygun şekilde yerleştirme sağlandığı gösterilmiştir. (Neeki MM & ark., 2021:000752).

Bununla birlikte, iğne dekompresyonunun yetersiz kaldığı ve etkin tedavi sağlanabilmesi için toraks direninin gerekli olduğu çeşitli araştırmalarla vurgulanmıştır (Britten S & Palmer SH, 1996:426; Britten S, Palmer SH & Snow TM, 1996:321; Conces DJ Jr & ark., 1988:55; Cullinane DC & ark., 2001:749; Jenkins C & Sudheer PS, 2000:925; Jones R & Hollingsworth J, 2002:176;

Mines D & Abbuhl S, 1993:863; Pattison GT, 1996:758; Kakaris S & ark., 2004:856).

Spontan pnömotoraks olgularında TP kliniğine dönüşüm oranı %1-5 olarak bildirilmektedir (Leigh-Smith S & Harris T, 2005:8). Klinik takip sırasında ani gelişen hipotansiyon, taşikardi, takipne, ajitasyon ve bilinç değişiklikleri TP gelişimi açısından dikkatle değerlendirilmelidir.

Birçok travma hastasında yaralanmayı takiben TP semptomları gecikmeli olarak gelişebilir. Bu nedenle, göğüs travması öyküsü olan hastaların acil serviste 3 ila 6 saat boyunca gözlemlenmesi ve taburcu edilmeden önce yeniden değerlendirilmesi önerilmektedir (Walls R & ark., 10th ed., 2022). Gelişmiş Travma Yaşam Desteği (Advanced trauma life support, ATLS®) kılavuzları, travmatik pnömotoraksı olan bir hastada tansiyon pnömotoraks gelişimini engellemek için göğüs drenajı yerleştirilmesini önermektedir (American College of Surgeons, 2013:1363).

Sonuç

TP olgularında klinik bulguların erken fark edilmesi, uygun tanısal araçların etkin kullanımı ve tedaviye gecikmeden başlanması, prognozu doğrudan etkileyen belirleyici unsurlardır. Bu nedenle etkili bir hasta yönetimi için güçlü bir klinik öngörü, dikkatli değerlendirme ve hızlı müdahale süreci gereklidir.

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BÖLÜM 2

SURGICAL APPROACH TO THORACIC INFECTIONS: A COMPREHENSIVE REVIEW

MURAT SARIÇAM[1]

Introduction

Thoracic infections, including pleural, lung, and mediastinal infections, pose significant challenges in clinical management due to their complexity and potential for severe complications. While antibiotics remain the cornerstone of treatment, surgical intervention is often necessary for certain cases, particularly when conservative measures fail or complications arise. This review examines the role of surgery in the management of thoracic infections, focusing on pleural empyema, lung abscesses, and mediastinitis. We explore the indications for surgical intervention, various surgical techniques, and outcomes, supported by relevant clinical evidence.

Thoracic infections encompass a broad spectrum of conditions that can involve the lungs, pleura, mediastinum, or chest wall. The common types include pneumonia, empyema, lung abscesses, and mediastinitis. The advent of antibiotics has

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significantly reduced the mortality of thoracic infections, yet severe cases and those complicated by factors like delayed diagnosis, inappropriate treatment, or underlying comorbidities may necessitate surgical intervention.

Surgical treatment aims to drain infected fluids, debride necrotic tissues, and, in some cases, resect infected lung tissue to prevent further dissemination of the infection. The choice of surgical intervention depends on the type, severity, and chronicity of the infection, as well as the patient's overall health status.

Pleural Empyema

Pleural empyema is an infection of the pleural space, typically resulting from bacterial pneumonia, chest trauma, or post-surgical infection. Empyema progresses through three stages: exudative, fibropurulent, and organizing. Surgical intervention is generally considered in the fibropurulent and organizing stages, especially when there is loculated fluid or thickened pleura.

Surgery is indicated in cases of:

1. Failure of conservative management: Persistent pleural effusion or lack of response to antibiotic therapy.

2. Loculated fluid collections: As seen in complex empyema, when drainage is ineffective.

3. Organized pleural thickening: Chronic infection leading to pleural fibrosis and impaired lung function.

Surgical approaches may be listed as:

1. Thoracocentesis: Typically the first line of treatment for diagnostic and therapeutic purposes. However, it is limited in cases of loculated fluid.

2. Tube Thoracostomy: A more invasive procedure that allows for the continuous drainage of pleural fluid. It is effective in many cases but may be insufficient for complicated empyema.

3. VATS (Video-Assisted Thoracoscopic Surgery): A minimally invasive technique that allows for pleural decortication, drainage, and biopsy. It is often preferred due to shorter recovery times and reduced complication rates.

4. Open Thoracotomy: In cases of extensive disease or failure of minimally invasive techniques, open surgery may be required to achieve complete drainage and debridement.

Studies indicate that VATS has a comparable or superior outcome to open thoracotomy in terms of recovery time, hospital stay, and complication rates (Bertolaccini & Rocco & Veronesi, 2013: 406). A meta-analysis demonstrated that VATS led to reduced mortality and shorter duration of hospitalization in patients with complicated empyema (Li & Wang & Li, 2017: 1225) .

Lung Abscesses

Lung abscesses are localized collections of pus within the lung parenchyma, commonly caused by bacterial infections, aspiration pneumonia, or post-surgical infections. Treatment often starts with antibiotics, but surgical intervention may be necessary in cases of large abscesses, failure to respond to medical treatment, or significant risk of rupture.

Surgical indications:

1. Failure of medical management: In cases of persistent or enlarging abscesses despite adequate antibiotic therapy.

2. Large abscesses: Large or multi-loculated abscesses that do not respond to drainage or antibiotics.

3. Risk of rupture: Abscesses located in the lower lobes of the lungs may rupture, leading to severe complications such as pleural infection or sepsis.

4. Recurrent infections: Abscesses that recur despite treatment.

Surgical approaches are as follows:

1. Drainage via Thoracostomy or VATS: For accessible abscesses, percutaneous or thoracoscopic drainage may be sufficient.

2. Lobectomy: In cases of large abscesses or when there is significant necrosis of lung tissue, lobectomy may be indicated.

3. Open Thoracotomy: In difficult cases or when other approaches fail, a more invasive open approach may be needed.

A study (Wang & Jiang & Lu, 2018: 79) found that VATS was highly effective in treating lung abscesses, with high success rates and low complication rates. Additionally, patients undergoing lobectomy for abscesses had a significantly lower recurrence rate (Liu & Zhang & Wu, 2020 : 1851).

Mediastinitis

Mediastinitis is a severe, life-threatening infection of the mediastinum, often caused by esophageal perforation, post-surgical infection, or spread from neighboring structures. The mortality rate of untreated mediastinitis is high, but early surgical intervention significantly improves survival.

Surgery is the primary treatment for mediastinitis and is indicated when:

1. Esophageal perforation: Often the cause of mediastinitis, especially after surgery or trauma.

2. Failure of conservative treatment: If the infection is not controlled by antibiotics and drainage.

3. Sepsis: Systemic infection necessitating urgent surgical management.

Surgery is applied as:

1. Drainage: Primary treatment involves drainage of the mediastinal space, either via a cervical incision or through thoracotomy, depending on the extent and location of the infection.

2. Esophageal Repair: If the infection is caused by esophageal perforation, surgical repair or resection of the perforated segment may be necessary.

3. Necrosectomy: Removal of necrotic tissues in cases of extensive tissue involvement

A systematic review (Kuss & Schwab, 2017: 240) emphasized that early surgical intervention, combined with broad-spectrum antibiotics, is associated with improved survival rates in mediastinitis. Additionally, delayed surgery is linked to higher rates of complications and mortality (Thiele & Bergman, 2020: 1425).

Conclusion

Surgical intervention remains a crucial component in the management of thoracic infections, particularly in complicated or severe cases. The development of minimally invasive techniques, such as VATS, has revolutionized the treatment of pleural empyema and lung abscesses, providing excellent outcomes with reduced morbidity. However, in cases of mediastinitis, early and aggressive surgery is vital for improving survival. A multidisciplinary approach, integrating both medical and surgical management, is essential for optimizing patient outcomes in these challenging cases.

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BÖLÜM 3

COMPARISON OF THORACOTOMY AND UNIPORTAL VATS TECHNIQUES IN LUNG RESECTIONS

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Introduction

Lung cancer ranks first among the causes of cancer-related deaths worldwide, with an increasing number of cases. According to the Global Cancer Statistics 2022 report, approximately 2.5 million new cases of lung cancer were diagnosed, and 1.8 million people lost their lives due to the disease in 2022 (Bray & ark, 2022). The standard surgical treatment for lung cancer is anatomical resection of the tumor-affected region (lobectomy or pneumonectomy) combined with mediastinal lymph node dissection (Toker & Kaya,

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2009). Thoracotomy pain is one of the most severe types of postoperative pain (Ochroch & ark, 2002). Inadequate pain control can lead to suppression of coughing and deep breathing, resulting in the development of pathophysiological intrapulmonary shunts and subsequent hypoxemia.

These pulmonary changes are most pronounced during the first two postoperative days but can return to their preoperative state within a week (Gerner, 2008; Yegin & ark, 2003). The classical approach for resection in cases of non-small cell lung cancer (NSCLC) is posterolateral thoracotomy (Whitson & ark, 2008). This incision has led to the prominence of Uniportal VATS (Video-Assisted Thoracoscopic Surgery) due to its potential to hinder compliance with respiratory physiotherapy, contribute to chronic pain syndrome in the long term, complicate adjuvant chemotherapy, and make resection unfeasible in patients with limited respiratory function tests (Whitson & ark, 2008). Unlike conventional thoracotomy, VATS is based on a monitoring screen and is performed through three or four 1.5 cm incisions in the chest wall using specialized surgical instruments (Yu & ark, 2019). Uniportal VATS incisions result in significantly less soft tissue damage and inflammation in the chest wall during follow-up compared to thoracotomy surgical incisions (Landreneau & ark, 1994). Effective pain management has been shown to improve postoperative lung function (Ochroch & ark, 2002).

Varela et al. (Varela & ark, 2006) reported that early postoperative FEV1 (Forced expiratory volume in one second) values in thoracotomy cases were, on average, 30% lower than the predicted FEV1 values. However, this reduction was observed to recover progressively in the following postoperative days, correlating with pain scoring. Several studies have demonstrated that Visual Analogue Scale (VAS) scores are lower in patients undergoing Uniportal VATS than those undergoing thoracotomy

(Landreneau & ark, 1993; Giudicelli & ark, 1994; Kirby & ark, 1993; Nagahiro & ark, 2001; Walker & ark, 2001). Additionally, improvements in pulmonary function and pain scores have been reported to be superior in Uniportal VATS patients compared to thoracotomy patients (Giudicelli & ark, 1994; Nagahiro & ark, 2001).

Few studies compare early and late pain scores in patients who have undergone Uniportal VATS. Studies comparing pain scores based on the number of ports have reported varying results. Mc Elnay et al. (McElnay & ark, 2015) reported that there was no significant difference in morphine usage between the uniportal and multiportal groups during the first 24 hours. One of the studies supporting this research, conducted by Socci L. et al. (Socci L & ark, 2013), found no significant difference in pain scores when comparing uniportal and biportal approaches in 24 patients who underwent volume-reduction surgery. Similar studies have shown that in cases of pneumothorax and pleural plication surgeries, there was no significant difference in pain scores or port numbers when considering Uniportal VATS (Wu & ark, 2013; Yang, Cho & Jheon, 2013).

This study aims to comparatively evaluate patients who underwent lung resection via Uniportal VATS or thoracotomy in terms of operative duration, intraoperative blood loss, number of lymph nodes retrieved, incision length, postoperative VAS score, duration of chest drain placement, length of hospital stay, and complications.

Materials and Methods

This study was approved by the Ethics Committee of the Faculty of Medicine, Erciyes University, with the decision dated 08.12.2017, 2017/549. The principles of the Helsinki Declaration were adhered to throughout the study. The study prospectively evaluated all patients who underwent lung resection surgery due to NSCLC in the Department of Thoracic Surgery between 01.01.2018 and 01.01.2020, and who signed the informed consent form.

The patients with chronic pain syndrome, those using opioid analgesics, and those who underwent pneumonectomy were excluded from the study. During the study, no patients were removed from the study cohort.

All patient groups underwent evaluation for mediastinal lymph node and distant organ metastasis. The cases were assessed by the anesthesia and resuscitation department before surgery. Patients aged 65 and above were preoperatively evaluated by the cardiology department.

Before resection, mediastinoscopy was performed for all patient groups. Surgical resection was planned for patients whose lymph nodes showed reactive findings. The patients were divided into two groups based on the surgical approach: the Uniportal VATS (U-VATS) group and the muscle-sparing thoracotomy (MST) group.

All patients were intubated under general anesthesia with a double-lumen endotracheal tube. A central venous catheter was inserted. The patients were positioned for a posterolateral thoracotomy.

In patients undergoing U-VATS, the incision was made on the anterior axillary line at the 4th or 5th intercostal space. During the surgery, a thoracoscope with high-resolution optics was introduced through this space, along with 5-mm angled surgical instruments, which enabled access to the thoracic cavity. Automatic stapling systems were used for vascular and bronchial structures, while endoscopic polymer clips were employed for appropriate vascular tissues. Following the procedure, a single drain was placed through the same incision.

In patients undergoing open surgical intervention, a muscle-sparing posterolateral thoracotomy was performed in the lateral decubitus position, with preservation of the serratus anterior muscle. A rib spreader was used. A chest drain was placed in the pleural cavity postoperatively.

In this study, patients who underwent surgery using two different methods were evaluated based on their pain scores, demographic characteristics, details of the surgical procedure, and length of hospital stay. All data were recorded in the database.

Each group was statistically analyzed using the SPSS (Statistical Package for the Social Sciences) version 22.0 software. Differences between groups were assessed using the Pearson Chi-square test, Fisher's Exact test, and the Wilcoxon test for dependent quantitative data analysis. In all statistical analyses, a p-value of <0.05 was considered statistically significant.

Results

Between January 2018 and January 2020, 30 cases were evaluated in our clinic who underwent surgical resection due to a diagnosis of NSCLC. The patients were categorized into two groups based on the type of surgery performed: U-VATS and MST.

In the U-VATS group, 73.3% (n=11) of the patients were male, whereas in the MST group, the male percentage was 80% (n=12). The mean age in the U-VATS group was 60.46 years (ranging from 44 to 73 years), while in the MST group, it was 62.93 years (ranging from 45 to 75 years). No statistically significant difference was found between the two groups regarding age and gender (gender $p=0.770$, age $p=0.359$) (Table 1).

Sixty-six point seven percent of the patients had adenocarcinoma, while 33.3% had squamous cell carcinoma. The diagnosis of five patients in the U-VATS group and six patients in the U-VATS group was made through intraoperative frozen section analysis.

The preoperative data revealed no statistically significant differences between the two groups regarding the presence of systemic disease (p=0.905) and smoking status (p=0.830). When evaluating the preoperative ASA (American Society of Anesthesiologists) scores of the patients, no significant difference was observed (p=0.823) (Table 1).

The patients included in the study underwent anatomical resection. Before surgery, all patients underwent fiberoptic bronchoscopy (FOB); endobronchial lesions were detected in 20% of the patients who underwent thoracotomy. No endobronchial lesions were identified in patients who underwent U-VATS.

The distribution of patients according to the types of resections is shown in Table 2.

When evaluated with postoperative pathology reports, the distribution of stages among patients in the groups is shown in Table 3-8. In the study, Stage IA3 was most prevalent in both the U-VATS and MST groups, followed by Stage IA2. No statistically significant difference was observed between the groups (p=0.507) (Table 3).

In the U-VATS group, no complications were observed, while in the MST group, one patient developed atelectasis and another developed an expansion defect (p=0.164). No statistically significant differences were found between the groups regarding the duration of surgery, intraoperative blood loss (p=0.475), and the number of lymph nodes retrieved during surgery (p=0.842). When comparing the length of hospital stay between the groups, it was found that the U-VATS group had a significantly shorter hospital stay than the MST group (p=0.001) (Table 4).

The VAS score of patients who underwent pulmonary resection via U-VATS was found to be statistically lower when compared to the VAS scores of patients who underwent MST (Table 5).

Discussion

In accordance with technological advancements in imaging systems and surgical instruments, there has been an increasing trend towards minimally invasive surgical methods in the surgical treatment of lung cancer (Gonzalez-Rivas, Yang & Calvin, 2016).

The goal of minimally invasive surgery is to perform surgical procedures that are equivalent in terms of quality and effectiveness to open techniques, while adhering to oncological surgical principles and using smaller incisions or incisions.

In this study, it was found that the incision size in the U-VATS group was statistically significantly shorter (p=0.01).

Nomori et al. (Nomori, Cong & Sugimura, 2016) conducted a study comparing postoperative pain scores between U-VATS, MST, and conventional thoracotomy. Their findings indicated similar results between the U-VATS and MST groups, while the conventional thoracotomy group demonstrated higher pain scores. However, no significant differences were observed in the chronic pain scores across the groups. Jutley et al (Jutley, Khalil & Rocco, 2005) evaluated 35 patients who underwent pneumothorax surgery using U-VATS and triportal VATS. In their study, they found that pain scores were significantly lower in the U-VATS group; however, they did not detect a statistically significant difference in chronic pain. In subsequent years, studies comparing Uniportal VATS techniques in terms of pain and quality of life, such as McElnay et al. (McElnay & ark, 2015), have reported no statistically significant difference between the groups undergoing Uniportal or multiportal lobectomy.

In our study, the VAS scale was evaluated postoperatively at the 4th, 8th, 12th, 24th, 48th, and 72nd hours, and it was found to be significantly lower in the U-VATS group.

In a review of nine studies evaluating patients who underwent lobectomy with U-VATS for early-stage lung cancer treatment, the average chest tube duration was reported as 4.2 days (De leyn & ark, 2014). In this study, the duration of chest tube placement in the U-VATS group was found to be 4.1 days, which is consistent with the literature.

Mediastinal lymph node sampling or dissection is a recommended surgical step for patients undergoing lobectomy for lung cancer. A study comparing the outcomes of mediastinal lymph node dissection in patients undergoing lobectomy via VATS and those undergoing open thoracotomy reported no significant differences between the two groups (Watanabe & ark, 2005).

The study, in which mediastinal dissection was initially performed using VATS and then converted to thoracotomy for further lymph node sampling by another surgeon, showed that only 2-3% of the lymph nodes might remain in the mediastinum (Sagawa & ark, 2002).

A study published in 2015 demonstrated that the average number of lymph nodes sampled was 8.3 in thoracotomy procedures and 7.4 in VATS resections. The p-value was calculated as 0.33, indicating no statistically significant difference (Nwogu & ark, 2015).

In another study, the mean number of lymph nodes sampled during thoracotomy was reported as 7 (range: 2–12), while the mean number sampled using VATS was 7 (range: 1–10). No statistically significant difference was observed between the two approaches ($p = 0.80$) (Fang & ark, 2018).

In our study, the average number of lymph node biopsies performed using U-VATS was found to be 4.5, while in the MST group, it was 4.8 (p=0.242). This result, consistent with the literature, indicates that lymph node excision performed through U-VATS can achieve a lymph node sampling rate comparable to that of MST.

In a study by Inada et al. (Inada & ark, 2000) and Jie Yang et al. (Yang & ark, 2014), it was reported that there was no significant difference between VATS lobectomy and standard lobectomy in terms of intraoperative bleeding and operation duration. In another study, it was found that VATS lobectomy resulted in less intraoperative bleeding and a shorter surgical duration (Sakuraba & ark, 2007).

In a study comparing operation times, the duration for thoracotomy was calculated to be 146 minutes (range: 87-410), while for VATS (video-assisted thoracoscopic surgery), the time was 145 minutes (range: 73-364). No statistically significant difference was found (p=0.411). Additionally, in the same study, the amount of bleeding during the operation was reported as an average of 100 ml (range: 20-400) for thoracotomy and 83 ml (range: 10-500) for VATS, with a p-value of 0.89 (Fang & ark, 2018).

In this study, the operation times for U-VATS and MST were found to be 233.8 minutes and 203.3 minutes, respectively. We attribute the longer duration of our study compared to the literature to the extended time spent on lymph node sampling.

In a study evaluating all VATS lobectomy cases performed by a single surgeon over three years, the first 20 patients were categorized as Group A, while patients operated on during the late phase of the surgeon’s learning curve were classified as Group B. The study's results indicated that the mean operative time was shorter in Group B (Brunswicker & ark, 2013).

Conclusion

In our study, patients who underwent pulmonary resection within two years were compared based on the type of incision, length of hospital stay, and their demographic and clinical characteristics.

During all follow-up periods, higher pain scores were observed in the MST group compared to the U-VATS group. This finding is thought to be associated with using a retractor during surgery in the MST group.

Minimally invasive surgical techniques are being developed and widely implemented worldwide.

The duration of U-VATS was as long as that of thoracotomy in our clinic, which we attribute to the learning process associated with adopting the U-VATS technique. The reasons for the growing interest in the U-VATS technique today include smaller surgical incisions, lower pain scores, shorter hospital stays, and the ability to sample lymph nodes at a rate comparable to thoracotomy.

We advocate for the necessity of supporting and enhancing this study in future research with a larger patient cohort.

Conflict of interest

The authors have no conflict of interest.

Table 1. The distribution of patient characteristics across groups is shown.

Characteristic		U-VATS	MST	p value
Age (years) (min-max)		60,46 (44-73)	62,93 (45-75)	0,359
Gender (n,%)	F	4 (26,7)	3 (20)	0,770
	M	11 (73,3)	12 (80)	
ASA Scala	1	3 (20)	0 (0)	0,823
	2	11 (73,33)	14 (93,33)	
	3	1 (6.67)	1(6.67)	
Comorbidities (n)		8 (53.3)	6 (40)	0.905
Smoking history (pack-years)	≥30	5 (33,3)	7 (46,3)	0.830
	<30	3 (20.1)	5 (33.3)	
	never	7 (46.6)	3 (20.1)	

Min: Minimum
Max: Maximum
F: Female
M: Male
ASA: American Society of Anesthesiologists

Table 2. The anatomic distribution of patients in the U-VATS and MST groups, based on the type of surgery performed, is presented.

	Surgical procedure	n (%)
U-VATS	Right lower lobe superior segmentectomy	1 (6.7)
	Right lower lobectomy	4 (26.7)
	Right upper lobectomy	2 (13.3)
	Left upper lobectomy	1 (6.7)
	Left lower lobe superior segmentectomy	1 (6.7)
	Left lower lobectomy	3 (20)
	Left upper lobectomy	3 (20)
MST	Right lower lobectomy	1 (6.7)
	Right middle lobectomy	1 (6.7)
	Right upper lobectomy	4 (26.7)
	Left lower lobectomy	5 (33.3)
	Left upper lobectomy	4 (26.7)

*Table 3. Distribution of patients among groups according to pathological stages (The 8th staging system completed by IASLC (International Association for the Study of Lung Cancer) was used.)**

	U-VATS	MST
Pathologic TNM stage	n (%)	n (%)
IA1	2 (13.3)	0 (0)
IA2	6 (40)	4 (26.7)
IA3	6 (40)	5 (33.3)
IB	1 (6.7)	2 (13.3)
IIA	0 (0)	2 (13.3)
IIB	0 (0)	2 (13.3)
TNM: Tumor, Node, Metastasis		

** Goldstraw & ark, 2015*

Table 4. The surgical outcomes are evaluated according to the groups.

	U-VATS	MST	
	Average (min-max)	Average (min-max)	p value
Duration of surgery (minute)	233.8 (180-250)	203.3 (130-225)	0.658
The length of surgical incision (cm)	3.6 (2.5-5)	15.3 (12-20)	0.01
Estimated intraoperative blood loss (ml)	97.3 (10-150)	116 (20-250)	0.475
Number of resected lymph node stations (n)	4.5 (2-7)	4.8 (2-7)	0.842
Chest tube dwelling days	4.1 (3-6)	6.93 (3-10)	0.002
Total hospital stay (day)	5.13 (4-7)	10.06 (6-14)	0.001
Postoperative complications (n)	0	2	0.164

Min: minimum
Max: maksimum

Table 5. The results of the intergroup evaluation of 'p' values for postoperative VAS score parameters are presented.

	Postoperatif VAS scores					
	4th hour p value	8th hour p value	12th hour p value	24th hour p value	48th hour p value	72nd hour p value
U-VATS / MST	0.001	0.001	0.002	0.002	0.002	0.001

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Güncel Temel ve Klinik

GÖĞÜS CERRAHİSİ