

Original Article

The importance of thoracic surgery clinics for emergency medicine: a retrospective analysis of consultations

İsmail Ertuğrul Gedik^{1*}, Okan Bardakçı², Timuçin Alar¹

¹Department of Thoracic Surgery, Çanakkale Onsekiz Mart University Faculty of Medicine, Çanakkale, Turkey

²Department of Emergency Medicine, Çanakkale Onsekiz Mart University Faculty of Medicine, Çanakkale, Turkey

ABSTRACT

Background: Thoracic Surgery serves as a consultant for many specialties of medicine. In this study, we aimed to analyze the basic characteristics of the consultations requested by the Department of Emergency Medicine to the Department of Thoracic Surgery in a university hospital.

Materials and Methods: This study includes the retrospective analysis of emergency medicine consultations of patients over the age of 18 to the Thoracic Surgery Clinics of Çanakkale Onsekiz Mart University (COMU) Faculty of Medicine between 01/03/2014 and 01/03/2020. The cases were analyzed in two groups: the consultations requested with the initiative of the emergency medicine physician (Group A) and consultations requested as per recommendations of other physicians (Group B).

Results: Of 486 consultations that met the inclusion criteria, 434 (89.3%) consultations were requested as per the recommendations of the emergency medicine physicians (Group A) and 52 (11.7%) were requested as per the recommendations of other physicians (Group B). No thoracic surgical diagnosis was established in 107 (22%) consultations. When compared between the two groups, no thoracic surgical pathology was found in 55 (12.6%) consultations from Group A and 52 (100%) consultations from Group B ($p < 0.001$).

Conclusion: In our study, no thoracic surgical diagnosis was established in more than 20% of consultations requested by the emergency service. We believe that adding formal rotation training to thoracic surgery during the residency training of emergency medicine, which is the first specialty that meets emergency applications, will lead the diagnosis and treatment of thoracic surgical emergencies faster and more accurately.

Keywords: consultation, thoracic surgery, emergency medicine, thoracic trauma, residency training

Corresponding Author*: İsmail Ertuğrul Gedik, MD. Department of Thoracic Surgery, Çanakkale Onsekiz Mart University, Faculty of Medicine, Çanakkale, Turkey.

E-mail: ertugrulgedik@gmail.com

Phone: +90 532 3313067

Doi: 10.26663/cts.2021.0021

Received 19.07.2021 accepted 12.08.2021

Introduction

Consultation can be defined as the request of a patient's responsible physician from another physician to evaluate the patient to seek the medical opinion regarding the diagnosis and treatment of a case [1,2]. Thoracic surgery serves as a consultant for many departments of medicine, mainly emergency medicine. Consultations constitute an important part of the routine workload of a thoracic surgeon. In this study, we aimed to analyze the basic characteristics of the consultations requested by the Department of Emergency Medicine to the Department of Thoracic Surgery in a university hospital and to determine how accurate the requested consultations are.

Materials and Methods

This study includes retrospective analysis of patients over the age of 18 who were consulted by the Emergency Department to the Department of Thoracic Surgery of the COMU Faculty of Medicine. Age, gender, and patient-specific medical record data were obtained anonymously. The cases were analyzed in two main groups: the consultations (Group A) requested as per the initiative of the Emergency medicine physician and the requested consultations as per the recommendations of other department physicians (Group B). Patients were also examined by dividing into various groups as causes of admission (traumatic, non-traumatic), types of trauma for patients with a history of trauma (penetrating and blunt thoracic trauma).

The study was approved by the Ethics Committee of Clinical Studies at Çanakkale Onsekiz Mart University (COMU) Faculty of Medicine with the approval number 2020-08. Our study was carried out following the ethical principles determined by the 1964 Helsinki Declaration and subsequent amendments. This study was supported by the Scientific Research Projects Unit of COMU with project number TSA-2020-3335.

Statistical Analysis

Mean, standard deviation, median, frequency, and percentage were used as descriptive statistics for demographic data such as age, gender and variables such as diagnosis, emergency intervention, termination of patients (emergency department, clinical hospitalization, intensive care unit hospitalization, referral, etc). The Chi-Square test was used to analyze categorical variables. *p* value less than 0.05 was considered significant.

The data obtained were analyzed using IBM SPSS for Windows version 19.

Results

A total of 1178 consultations were evaluated for this study. 666 of these were inpatient consultations requested from other clinics and 26 emergency room patients under the age of 18 were both excluded from the study. The consultation data of 486 patients who met the criteria for inclusion were analyzed within the scope of our study (Figure 1).

The mean age of the 486 consultation cases requested by the emergency department was 56.04 ± 19.2 . Of the cases included in our study, 383 (78.8%) patients were male and 103 (21.2%) were female (Table 1).

Ninety-nine (20.4%) consultations were requested for non-traumatic patients and 387 (79.6%) were requested for trauma-related admissions. The most common development mechanism of traumas was in-car traffic accidents with 152 (39.3%) and the second-most common mechanism was falls with 138 (35.7%) cases. As a result of the consultations of 387 traumatic cases, it was determined that the most common diagnosis was rib fracture with 106 (27.3%) cases. No pathological findings were detected in 104 (26.8%) of patients who were consulted with thoracic surgery because of trauma. As a result of the most frequent consultations, other traumatic and non-traumatic consultations and the diagnoses established by thoracic surgery are indicated in table 1.

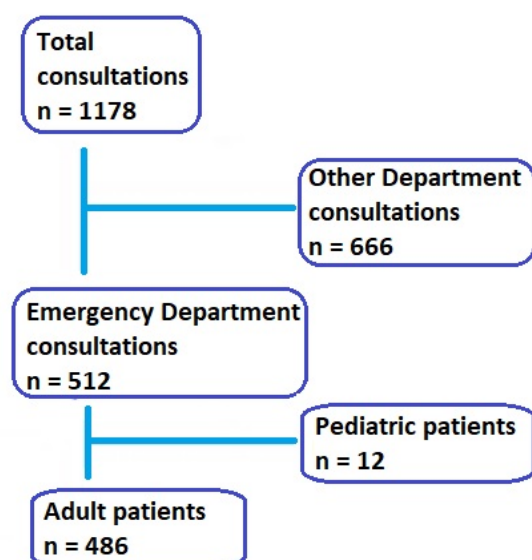


Figure 1. Flow diagram of the patients included in the study.

Table 1. Demographic data and general characteristics of the patients included in the study.

| | |
|---------------------------|-----------------------------------|
| Age | Mean± std deviation 56.04±19.2 |
| Gender | n (%) |
| Male | 383 (78.8) |
| Female | 103 (21.2) |
| Results of consultations | n (%) |
| <i>Non-traumatic</i> | 99 (20.4) |
| Pneumothorax | 37 (7.6) |
| Pleural effusion | 34 (7.0) |
| Lung cancer | 5 (1.0) |
| Empyema | 5 (1.0) |
| Others | 18 (3.8) |
| <i>Traumatic</i> | 387 (79.6) |
| Rib Fracture | 106 (21.8) |
| No pathology | 104 (21.3) |
| Pneumothorax | 54 (11.1) |
| Contusion | 35 (7.2) |
| Hemo-pneumothorax | 27 (5.6) |
| Hemothorax | 27 (5.6) |
| Others | 34 (7.0) |
| Cause of trauma | n (%) |
| <i>Blunt trauma</i> | 361 (93.3) |
| MVA | 152 (39.3) |
| Falls | 138 (35.7) |
| Motorcycle accidents | 35 (9.0) |
| MVAIP | 15 (3.9) |
| Others | 21 (5.4) |
| <i>Penetrating trauma</i> | 26 (6.7) |

Abbrev.: MVA; Motor vehicle accidents, MVAIP; Motor vehicle accidents involving pedestrians

A total of 434 (89.3%) of the consultations were requested with the initiative of the emergency medicine physician (Group A) and 52 (11.7%) with the recommendation of other department physicians (Group B). All consultations in Group B were requested for patients presenting due to trauma. Orthopedics (n = 21, 40.4%) and Neurosurgery (n = 14, 26.9%) recommended consultations were the top two departments that recommended Thoracic surgery consultation in Group B. No thoracic surgical diagnosis was established in 107 (22%) of the 486 consultations included in our study. When the percentage of the absence of thoracic surgical diagnoses as a result of the consultations were com-

pared among groups, no thoracic surgical diagnosis was established in 55 (12.6%) of the 434 consultations requested in Group A and all of the 52 consultations (100%) in Group B. And this difference was statistically significant ($p < 0.001$) (Table 2). It was determined that 104 (97.2%) of the 107 patients who did not have thoracic surgical pathology were traumatic admissions. All patients in Group B were found to have trauma-induced admissions. When the patients in Group A and Group B were examined in terms of chest surgery emergency intervention needs, 147 (33.9%) patients in Group A had undergone emergency thoracic surgical intervention, while no patients in Group B were treated by thoracic surgery and the difference was statistically significant ($p < 0.001$) (Table 2).

When the emergency thoracic surgical interventions applied to the patients included in our study were examined, it was determined that the most common intervention was chest tube thoracostomy with 120 (27.6%) cases (Table 2).

As a result of these 486 consultations, 152 (31.3%) patients were discharged from the emergency department, and physicians decided to treat 334 (68.7%) patients in the hospital. 255 (76.3%) of the 334 patients who were hospitalized were treated in inpatient clinics and 56 (16.8%) were hospitalized in the intensive care unit (ICU), and 23 (6.9%) were referred to other hospitals (Table 2). The indication of the referral of all 23 patients who were referred from our hospital was determined to be the lack of available beds in the ICU. Both groups were compared in terms of the patients who were discharged from the emergency department and hospitalized to other clinics, 141 (32.5%) patients in Group A were discharged from the emergency department and 49 (11.3%) patients were hospitalized in other clinics. In Group B, 11 (21.2%) patients were discharged from the emergency department, 33 (63.4%) patients were hospitalized to other clinics ($p = 0.220$). As a result of the consultations in Group B, there were no patients hospitalized in the thoracic surgery clinics whereas 173 (39.9%) patients were hospitalized in the thoracic surgery clinics in Group A ($p < 0.001$).

Table 2. Comparison of groups in terms of pathological findings, type of intervention, and hospitalization status.

| | Group A n=434 (89.3%) | Group B n=52 (10.7%) | P |
|-------------------------------|--------------------------|-------------------------|-----------|
| Pathological finding | | | |
| Yes | 379 (87.4) | 0 (0) | |
| No | 55 (12.6) | 52 (100) | <0.001 |
| Intervention | | | |
| Yes | 147 (33.9) | 0 (0) | |
| No | 287 (66.1) | 52 (100) | <0.001 |
| Intervention type | | | |
| Chest tube thoracostomy | 120 (27.6) | 0 (0) | |
| Thoracentesis | 13 (3.0) | 0 (0) | |
| Catheter thoracostomy | 5 (1.2) | 0 (0) | |
| Other | 9 (2.1) | 0 (0) | |
| No intervention | 287 (66.1) | 0 (0) | |
| Hospitalization status | | | |
| Discharged | 141 (32.5) | 11 (21.2) | |
| ICU | 49 (11.3) | 7 (13.4) | |
| Referred | 22 (5.1) | 1 (1.9) | =0.220 |
| Inpatient clinics | 222 (51.1) | 33 (63.5) | |
| | Thoracic surgery | 173 (39.9) | 0 (0) |
| | Other clinics | 49 (11.3) | 33 (63.5) |

Abbrev.: ICU; Intensive care unit, Ns; not significant

Discussion

Consultation means requesting the opinion of other physicians regarding the diagnosis and treatment of a patient for guiding the diagnosis and the treatment of the patient in line with these recommendations. It is a medical advisory system based on mutual communication between the primary physician and the consultant physician [1-3].

Thoracic surgery is a department that serves almost all departments of medicine, especially the emergency department, as a consultant physician [3,4]. Thoracic surgery is obliged to make an urgent diagnosis and treat a wide range of diseases such as blunt and penetrating thoracic trauma and related complications (rib fractures, traumatic hemothorax, and traumatic pneumothorax), spontaneous pneumothorax, pleural effusion, tracheobronchial foreign body aspirations. Especially for the consultations requested by emergency departments due to trauma, spontaneous pneumothorax, and tracheobronchial foreign body aspirations, prompt diagnosis and the application of emergency treatment are of great importance to prevent possible morbidity and mortality [5-7].

In the literature, it has been reported that the emergency medicine department requests the most frequent number of consultations from the department of thoracic surgery [3]. In our study, 512 of the 1178 consultations requested from our thoracic surgery clinic over 6 years were requested by the emergency department and 486 (41.3%) consultations were examined following the criteria of our study. In the light of this data, it can be concluded that the most frequently requested consultations from the thoracic surgery clinics are found to be consultations from emergency medicine.

The majority (78.8%) of the cases included in our study were male. In addition, it was determined that most of the applications of these patients in our study were traumatic applications (79.6%). It was determined that most applications for non-traumatic etiology were due to lung cancer and spontaneous pneumothorax. Considering that the majority of hospital admissions secondary to thoracic trauma and non-traumatic diseases such as lung cancer and spontaneous pneumothorax are more frequently detected in the male gender, it is expected that the vast majority of patients consulted in thoracic surgery are of male gender [8-10].

Chest tube thoracostomy is adequate in approximately 90% of patients who require emergency intervention [11]. In this case, it can be concluded that the most common type of emergency intervention as a result of the consultations requested by the emergency department from thoracic surgery is chest tube thoracostomy. In the results of our study, it was determined that the most common type of emergency intervention applied by thoracic surgery to patients construed by the Emergency Department was tube thoracostomy (n = 120, 81.6%); which is compatible with the literature.

Of the 486 consultations included in our study, 434 (89.3%) were primarily requested by the emergency department on the initiative of the emergency medicine physician (Group A) and 52 (10.7%) were requested by the emergency department at the suggestion of other department physicians (Group B). While no thoracic surgical diagnosis was established in 55 (12.6%) of the consultations in Group A, no thoracic surgical diagnosis was established in any of the 52 consultations (100%) in Group B. All patients in Group B are traumatic admissions. Of the five main departments (Emergency Medicine, General Surgery, Thoracic Surgery, Neurosurgery, Orthopedics, and Traumatology) that deal with the vast majority of traumas in our country, thoracic surgery clinical rotation is available during the residency training only for general surgery. This situation may cause physicians who work in these departments the necessity to consult for the opinion of the thoracic surgery clinics, where they have not received any formal training to rule out a possible thoracic trauma in multi-traumatic applications. We think that it is practically not functional for each department to rotate with each other during their residency training. However, we believe that it is extremely necessary to establish a formal rotation training program during residency training to the thoracic surgery department from the department of emergency medicine, which primarily gives care to all traumas which are directly and indirectly responsible for 75% of trauma-related mortality [11,12]. In the future, this type of training program will be able to improve the knowledge and emergency response skills of emergency medicine specialists related to thoracic surgical emergencies and may prevent possible morbidity and mortality due to these conditions. In addition, patients who do not have any thoracic surgical pathology can be unnecessarily consulted, preventing the delay of the actual diagnosis and treatment of the patient, and ensuring that the time of the consult to thoracic surgeon can be

transferred to the patients who need care from their department. No study in the literature contained data similar to our study and therefore no comparison could be made. Thus we believe a randomized multicenter study on this subject may enlighten this need and proper changes in the guidelines of residency training can be made.

In conclusion thoracic surgery provides consultancy services to many departments and emergency medicine is the primary department to request a consultation from thoracic surgery. In our study, no pathological conditions were detected in approximately 25% of the consultations requested by the emergency department. Adding a formal thoracic surgery rotation program to the residency training of the departments that give care to trauma does not seem practical. But the addition of formal rotation training to thoracic surgery during the residency training of emergency medicine, which is the first specialist to meet emergency applications, might be more suitable. Thus, emergency department physicians can establish the diagnosis more promptly and accurately. And they may perform the treatment of thoracic surgical emergencies with self-confidence by performing chest tube thoracostomy in hospitals where there is no thoracic surgeon. In addition, we believe that thoracic surgeons will be able to transfer their time to patients who can benefit from their medical knowledge and skills.

Declaration of conflicting interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

This work was supported by the Çanakkale Onsekiz Mart University as Scientific Research Project (TSA-2020-3335).

Ethics Approval

This study was approved by the Clinical Studies Ethics Committee of Çanakkale Onsekiz Mart University Faculty of Medicine with the approval number of 2020-08 on 07 May 2020. Written informed consent was received from all participants of this study.

Authors' Contributions

İEG, OB, and TA: co-wrote the paper, collected the data, performed the analysis, contributed data/analysis tools, conceived and designed the analysis.

References

1. Kessler C, Kutka BM, Badillo C. Consultation in the emergency department: a qualitative analysis and review. *J Emerg Med* 2012; 42: 704-11.
2. "Consultation." Merriam-Webster.com Dictionary, Merriam-Webster, Available at: <https://www.merriam-webster.com/dictionary/consultation>. Accessed February 24, 2021.
3. Cobanoglu U. Evaluation of breast surgery construed cases in a university hospital. *Turk Toraks Der* 2009; 10: 117-21.
4. Tarrant C, Stokes T, Colman AM. Models of the medical consultation: opportunities and limitations of a game theory perspective. *Qual Saf Health Care* 2004; 13: 461-6.
5. Dennis BM, Bellister SA, Guillaumondegui OD. Thoracic Trauma. *Surg Clin North Am* 2017; 97: 1047-64.
6. Hewlett JC, Rickman OB, Lentz RJ, Prakash UB, Maldonado F. Foreign body aspiration in adult airways: therapeutic approach. *J Thorac Dis* 2017; 9: 3398-409.
7. Bintliffe O, Maskell N: Spontaneous pneumothorax. *BMJ* 2014; 348: g2928.
8. Dongel I, Coskun A, Ozbay S, Bayram M, Atli B. Management of thoracic trauma in emergency service: Analysis of 1139 cases. *Pak J Med Sci* 2013; 29: 58-63.
9. Hellyer JA, Patel MI. Sex disparities in lung cancer incidence: validation of a long-observed trend. *Transl Lung Cancer Res* 2019; 8: 543-5.
10. Bobbio A, Dechartres A, Bouam S, Damotte D, Rabbat A, Régnard JF et al. Epidemiology of spontaneous pneumothorax: gender-related differences. *Thorax* 2015; 70: 653-8.
11. Meredith JW, Hoth JJ. Thoracic trauma: when and how to intervene. *Surg Clin North Am* 2017; 87: 95-118.
12. Narayanan R, Kumar S, Gupta A, Bansal VK, Sagar S, Singhal M et al. An Analysis of Presentation, Pattern and Outcome of Chest Trauma Patients at an Urban Level 1 Trauma Center. *Indian J Surg* 2018; 80: 36-41.

This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).