



TRAKEAL VE BRONŞİYAL YARALANMALAR

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GİRİŞ

Trakeal bronşiyal yaralanmalar (TBY), nadir görülen fakat hayatı tehdit eden yaralanmalardır. Etiyolojisine bağlı olarak iyatrojenik ve travmatik olarak iki grupta incelenebilir. İyatrojenik yaralanmalar yetişkinlerde en sık TBY sebebidir. Travmatik TBY ise en sık künt travmalar sonrasında görülmektedir (1-5). Künt travmaya sekonder gelişen yaralanmaların en az %30-42' si ölümcül olup, bu hastaların %50-80' i ilk saat içinde hayatını kaybetmektedir (1,6-8). Trakeobronşiyal yaralanmaların uygun yaklaşım ile etkili şekilde tedavi edilebilmesi için erken tanı ve klinik farkındalık gereklidir.

Bu bölümde TBY'nin risk faktörlerini, klinik belirtilerini, tanı ve tedavisini literatür eşliğinde tartışmayı amaçlıyoruz.

TARIHÇE

Trakeal bronşiyal yaralanmalar ile ilgili ilk yayın, 1873 yılında trafik kazası sonrası ex olan kişinin otopsi bulgusu olarak sağ ana bronş rüptürünün bildirimidir (9). İlk cerrahi deneyim 1913 yılında Dr. Hotz tarafından sunulmuştur (10). İlk kez bronş yaralanması sonrası uzun sağ kalım 1927 yılında bildirilmiş ve 1931 yılında Nissen sol ana bronş yaralanması olan 12 yaşındaki olguda başarılı sol pnömonektomi ve yine sol ana bronş yaralanması olan bir olguda sleeve rezeksiyonu yayımlamıştır (11).

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layıcıların eğitimi önemlidir. Trachea ve bronşiyal yaralanması olan hastaların dikkatli değerlendirilmesi, etkili hava yolu yönetimi, en kısa sürede deneyimli göğüs cerrahisi kliniği bulunan merkezlere yönlendirilerek takip ve tedavisinin planlanması önerilir. Tüm TBY'li hastalarda iyi sonuçlar için; hızlı tanı, başarılı cerrahi müdahale ve klinik farkındalık şarttır.

KAYNAKLAR

1. Kirsh MM, Orringer MB, Behrendt DM, Sloan H. Management of tracheobronchial disruption secondary to nonpenetrating trauma. *Ann Thorac Surg*. 1976 Jul;22(1):93-101.
2. Kiser AC, O'Brien SM, Detterbeck FC. Blunt tracheobronchial injuries: treatment and outcomes. *Ann Thorac Surg*. 2001 Jun;71(6):2059-65.
3. Karmy-Jones R, Wood DE. Traumatic injury to the trachea and bronchus. *Thorac Surg Clin*. 2007 Feb;17(1):35-46.
4. Schneider T, Storz K, Dienemann H, Hoffmann H. Management of iatrogenic tracheobronchial injuries: a retrospective analysis of 29 cases. *Ann Thorac Surg*. 2007 Jun;83(6):1960-4.
5. Mussi A, Ambrogi MC, Ribechini A, Lucchi M, Menoni F, Angeletti CA. Acute major airway injuries: clinical features and management. *Eur J Cardiothorac Surg*. 2001 Jul;20(1):46-51, discussion 51-2.
6. Rossbach MM, Johnson SB, Gomez MA, Sako EY, Miller OL, Calhoon JH. Management of major tracheobronchial injuries: a 28-year experience. *Ann Thorac Surg*. 1998 Jan;65(1):182-6. doi: 10.1016/s0003-4975(97)01001-1. PMID: 9456114.
7. Bertelsen S, Howitz P. Injuries of the trachea and bronchi. *Thorax*. 1972 Mar;27(2):188-94. doi: 10.1136/thx.27.2.188. PMID: 5034596; PMCID: PMC472519.
8. Kummer C, Netto FS, Rizoli S, Yee D. A review of traumatic airway injuries: potential implications for airway assessment and management. *Injury*. 2007 Jan;38(1):27-33.
9. Seuvre M. Crushing injury from the wheel of an omnibus: rupture of right bronchus. *Bull Soc Anat Paris* 1873;48:680.
10. Vierheilig J. Diesubkutane Bronchus zerreibung. *Beitragezur Klinischen Chirurgie* 1914;93:201-21.
11. Nissen R. Development of total pneumonectomy. *Am J Surg*. 1949 Dec;78(6):816-20, illust.
12. Özdülger A. Trakeobronşiyal Yaralanmalar. TTD Toraks Cerrahisi Bülteni. 2010; 1: 45-54.
13. Roxburg JC. Rupture of the tracheobronchial tree. *Thorax*. 1987; 42: 681-8.
14. Rossbach MM, Johnson SB, Gomez MA et al. Management of Major Tracheobronchial Injuries: A 28-Year Experience. *Ann Thorac Surg*. 1998; 65: 182-6.
15. Grillo HC. Tracheal and bronchial trauma. InGrillo HC ed. *Surgery of the trachea and bronchi*. London B.C. Hamilton Inc, 2004; 271-90.
16. Welter S. Repair of tracheobronchial injuries. *Thorac Surg Clin*. 2014 Feb;24(1):41-50. doi: 10.1016/j.thorsurg.2013.10.006. PMID: 24295658.
17. Rieth A, Varga E, Kovács T, Ottlakán A, Németh T, Furák J. Contemporary management strategies of blunt tracheobronchial injuries. *Injury*. 2020 Jul 10:S0020-1383(20)30607-0

18. Schneider T, Volz K, Dienemann H, et al. Incidence and treatment modalities of tracheobronchial injuries in Germany. *Interact Cardiovasc Thorac Surg* 2009; 8:571-6.
19. Hood RM. Injury to the trachea and major bronchi. In: Hood, Boyd and Culliford eds. *Thoracic Trauma*. Philadelphia, W.B. Saunders Company; 1989: 245-66
20. Gussack GS, Jurkovich GJ, Luterman A. Laryngo tracheal trauma: a protocol approach to a rare injury. *Laryngoscope*. 1986 Jun;96(6):660-5
21. Pate JW. Tracheobronchial and esophageal injuries. *Surg Clin North Am*. 1989 Feb;69(1):111-23.
22. Lee RB. Traumatic injury of the cervico thoracic trachea and major bronchi. *Chest Surg Clin N Am*. 1997 May;7(2):285-304. PMID: 9156293.
23. Dennis BM, Bellister SA, Guillamondegui OD. Thoracic Trauma. *Surg Clin North Am*. 2017 Oct;97(5):1047-1064. doi: 10.1016/j.suc.2017.06.009. PMID: 28958357.
24. Symbas PN, Justicz AG, Ricketts RR. Rupture of the airways from blunt trauma: treatment of complex injuries. *Ann Thorac Surg* 1992;54(1):177-83.
25. Grewal HS, Dangayach NS, Ahmad U, Ghosh S, Gildea T, Mehta AC. Treatment of Tracheobronchial Injuries: A Contemporary Review. *Chest*. 2019 Mar;155(3):595-604. doi: 10.1016/j.chest.2018.07.018. Epub 2018 Jul 27. PMID: 30059680; PMCID: PMC6435900.
26. Symbas PN, Hatcher CR Jr, Vlasis SE. Bullet wounds of the trachea. *J Thorac Cardiovasc Surg*. 1982 Feb;83(2):235-8. PMID: 7057666
27. Kelly JP, Webb WR, Moulder PV, Everson C, Burch BH, Lindsey ES. Management of airway trauma. I: Tracheobronchial injuries. *Ann Thorac Surg*. 1985 Dec;40(6):551-5.
28. Glazer ES, Meyerson SL. Delayed presentation and treatment of tracheobronchial injuries due to blunt trauma. *J Surg Educ*. 2008 Jul-Aug;65(4):302-8. doi: 10.1016/j.jsurg.2008.06.006. PMID: 18707665.
29. Singh N, Narasimhan KL, Rao KL, Katariya S. Bronchial disruption after blunt trauma chest. *J Trauma*. 1999 May;46(5):962-4. doi: 10.1097/00005373-199905000-00035. PMID: 10338424.
30. Tack D, Defrance P, Delcour C, Gevenois PA. The CT fallen-lungs sign. *Eur Radiol*. 2000;10(5):719-21. doi: 10.1007/s003300050992. PMID: 10823621
31. Scaglione M, Romano S, Pinto A, Sparano A, Scialpi M, Rotondo A. Acute tracheo bronchial injuries: Impact of imaging on diagnosis and management implications. *Eur J Radiol*. 2006 Sep;59(3):336-43.
32. Balci AE. Tracheobronşiyal yaralanmalar. *Turkiye Klinikleri J SurgMedSci*. 2007; 3[47]: 52-62.
33. Gómez-Caro A, Ausín P, Moradiellos FJ, Díaz-Hellín V, Larrú E, Pérez JA, de Nicolás JL. Role of conservative medical management of tracheobronchial injuries. *J Trauma*. 2006 Dec;61(6):1426-34; discussion 1434-5.
34. Riyad KJ, Douglas EW. Traumatic Injury of the Trachea and Bronchus. *Thorac Surg Clin*. 2007; 17: 35-46
35. Grillo HC. Surgical treatment of postintubation tracheal injuries. *J Thorac Cardiovasc Surg*. 1979 Dec;78(6):860-75. PMID: 502569
36. Prokakis C, Koletsis EN, Dedeiliás P, Fligou F, Filos K, Dougenis D. Airway trauma: a review on epidemiology, mechanisms of injury, diagnosis and treatment. *J Cardiothorac Surg*. 2014 Jun 30;9:117
37. Altinok T, Can A. Management of Tracheobronchial Injuries. *Eurasian J Med*. 2014 Oct;46(3):209-15.
38. Shemmeri E, Vallières E. Blunt Tracheobronchial Trauma. *Thoracic Surgery Clinics*.

- 2018 Aug 1;28(3):429–34.
- 39. Richardson JD. Outcome of tracheobronchial injuries: a long-term perspective. *J Trauma*. 2004 Jan;56(1):30-6.
 - 40. Cassada DC, Munyikwa MP, Moniz MP, Dieter RA Jr, Schuchmann GF, Enderson BL. Acute injuries of the trachea and major bronchi: importance of early diagnosis. *Ann Thorac Surg*. 2000 May;69(5):1563-7. doi: 10.1016/s0003-4975(00)01077-8. PMID: 10881842
 - 41. Balci AE, Eren N, Eren S, Ulkü R. Surgical treatment of post-traumatic tracheobronchial injuries: 14-year experience. *Eur J Cardiothorac Surg*. 2002 Dec;22(6):984-9.
 - 42. Hofmann HS, Rettig G, Radke J, Neef H, Silber RE. Iatrogenic ruptures of the tracheobronchial tree. *Eur J Cardiothorac Surg*. 2002 Apr;21(4):649-52
 - 43. Massard G, Rougé C, Dabbagh A, Kessler R, Hentz JG, Roeslin N, Wihlm JM, Morand G. Tracheobronchial lacerations after intubation and tracheostomy. *Ann Thorac Surg*. 1996 May;61(5):1483-7
 - 44. Mussi A, Ambrogi MC, Menconi G, Ribechini A, Angeletti CA. Surgical approaches to membranous tracheal wall lacerations. *J Thorac Cardiovasc Surg*. 2000 Jul;120(1):115-8
 - 45. Miñambres E, Burón J, Ballesteros MA, Llorca J, Muñoz P, González-Castro A. Tracheal rupture after endotracheal intubation: a literature systematic review. *Eur J Cardiothorac Surg*. 2009 Jun;35(6):1056-62
 - 46. Schneider T, Volz K, Dienemann H, Hoffmann H. Incidence and treatment modalities of tracheobronchial injuries in Germany. *Interact Cardiovasc Thorac Surg*. 2009 May;8(5):571-6
 - 47. Kost KM. Endoscopic percutaneous dilatational tracheotomy: a prospective evaluation of 500 consecutive cases. *Laryngoscope*. 2005 Oct;115(10 Pt 2):1-30. doi: 10.1097/01.MLG.0000163744.89688.E8. PMID: 16227862.
 - 48. Pandit RA, Jacques TC. Audit of over 500 percutaneous dilatational tracheostomies. *Crit Care Resusc*. 2006 Jun;8(2):146-50. PMID: 16749884.
 - 49. Bartels HE, Stein HJ, Siewert JR. Tracheobronchial lesions following oesophagectomy: prevalence, predisposing factors and outcome. *Br J Surg*. 1998 Mar;85(3):403-6. doi: 10.1046/j.1365-2168.1998.00579.x. PMID: 9529504.
 - 50. Borasio P, Ardissoni F, Chiampo G. Post-intubation tracheal rupture. A report on ten cases. *Eur J Cardiothorac Surg*. 1997 Jul;12(1):98-100. doi: 10.1016/s1010-7940(97)00111-5. PMID: 9262088.
 - 51. Rollins RJ, Tocino I. Early radiographic signs of tracheal rupture. *AJR Am J Roentgenol*. 1987 Apr;148(4):695-8. doi: 10.2214/ajr.148.4.695. PMID: 3493651.
 - 52. Sippel M, Putensen C, Hirner A, Wolff M. Tracheal rupture after endotracheal intubation: experience with management in 13 cases. *Thorac Cardiovasc Surg*. 2006 Feb;54(1):51-6. PMID: 16485190.
 - 53. Krassas A, Mallios D, Iliadis I, Agiannidou A, Boulia S, Iliadis K. Bronchoscopic Repair of Tracheal Laceration Using Conventional Instrumentation: A Novel Technique. *Ann Thorac Surg*. 2020 Feb;109(2):e141-e143.