VOLUME-8, ISSUE-7, JULY-2019 • PRINT ISSN No. 2277 - 8160

Original Research Paper

Surgery

INTRALUMINAL TRACHEAL TUMORS- OUR INSTITUTIONAL EXPERIENCE

Dr. Ezhilan. K. S	Institute Of Cardiovascular and Thoracic Surgery, Madras Medical College, India
Prof. Mariappan. B*	Institute Of Cardiovascular and Thoracic Surgery, Madras Medical College, India *Corresponding Author
Prof. Sivaraman. A	Institute Of Cardiovascular and Thoracic Surgery, Madras Medical College, India
Dr. Ajay. Narasimhan	Institute Of Cardiovascular and Thoracic Surgery, Madras Medical College, India

ABSTRACT Primary tracheal tumors are a rare in occurrence,They are less common than bronchial tumors. Patients present with symptoms like breathlessness, cough, hemoptysis, wheeze and stridor. Of all Primary tracheal tumors, 2/3 rd form squamous cell carcinoma and adenoid cystic carcinoma. The rest form a variety of both malignant and benign tumors .About 40-50% of tumors located in the lower trachea or bifurcation. Resection and anastamosis of lower trachea is difficult and challenging due to presence of great vessels and anatomical position of trachea in the middle mediastinum.we present two cases, one with Adenoid cystic carcinoma and other with myo-fibroblastic tumor for their presentation and management.

KEYWORDS : Tracheal cancer; Tracheal resection; Tracheal surgery; Benign Inflammatory Pseudo tumor; Adenoid cystic carcinoma (ACC); cross field ventilation

INTRODUCTION:

Primary tracheal tumors are a rarity,They have an incidence of 2.7 cases per million[1],about 100 times less common than bronchial tumors and account for 2% of all upper respiratory tract tumors[2,12]. They present with a multitude of symptoms like breathlessness, cough, hemoptysis, wheezing and stridor[1,2,3,12]. About 2/3 rd of the tumors are either squamous cell carcinoma or adenoid cystic carcinoma. The rest for a wide variety of both malignant and benign tumors[1].about 40-50% of tumors located in the lower trachea or bifurcation [12]. Resection and anastamosis is difficult and challenging with lower tracheal tumors [12].we present two cases, one with Adenoid cystic carcinoma and other with myo-fibroblastic tumor for their presentation and management.

Case 1

A 37 year old male, a non smoker, came with h/o Breathlessness for 8 months, physical examination showed air entry was decreased in the right lung. Bronchoscopy showed tumor occupying the lower trachea, blocking right main bronchus. Computed Tomography (CT) showed tumor in the lower trachea at the level of carina, partially obstructing right main bronchus.{Fig 1.} Patient was planned and was worked up for tracheal sleeve resection and anastamosis of right main bronchus to trachea. Prior to surgery, he developed mild stridor He underwent rigid Bronchoscopy [1,12] and de-bulking of tumor. Patient became symptomatically better. Biopsy showed features suggestive of benign teratoma. A week after de-bulking he again developed breathlessness. He underwent elective surgery. Patient in supine position, intubated with single lumen ET tube such that lower end of ET tube was above the tumor and draped. Median sternotomy was done. Pericardium dissected, cradle created.Space between aorta, innominate vein, superior vena-cava (SVC) and right pulmonary artery (RPA) was dissected. Lower trachea was reached. Through the ET tube, a flexible bronchoscope was introduced [1,2]. The position of light source was visualized through the anterior wall of trachea . A small hypodermic needle was introduced through anterior wall of trachea. The extent of tumor was delineated and was used as a guide for the area to be resected[14]. Stay sutures were taken using 3-0 vicryl above and below [14]. The trachea was opened 1.5 cm superior to carina and was excised circumferentially. Suctioning was done in the distal part of trachea and right and left main bronchii. A 6.5 Fr flexo-metallic ET tube was inserted into left main bronchus and single lung, cross-field ventilation was done [1,4,5,9]. The trachea above the tumor was excised while using light source from bronchoscope and direct visualisation. The tunour was 4x3x3 cm size boselated mass occupying the lower part of trachea about 2 cm superior to carina, involving the posterior wall of trachea about 3 cms. and mass protruding into right main bronchus and obstructing it. The tumor was excised in toto along with 4.5 cms of trachea. The neck was flexed.The superior and inferior parts of trachea were anastamosed using 4-0 prolene in continuous fashion [10] from 6-o' clock to 9-o' clock and 3-o' clock positions. With 2-0 ethibond intermittent sutures in-between - 2 stitches on either side. Suctioning of the bronchii was done. Flexometallic tube was removed and anastamosis carried out anteriorly with 4-0 prolene. Anastamosis checked for leaks and stay sutures were tied on either side to reinforce primary anastamosis. Right pleuro pericardial tissue was brought posterior to SVC and placed over anastamosis. Right Pleuropericardial drain placed. Chest closed in layers after hemostasis. Chin stitches applied Bronchoscopy done with suctioning of bronchii and trachea. Patient was extubated on table. There were no post op complications. Chin stitch was removed on 7th postop day[14] and patient discharged. Biopsy resulted as Benign Inflammatory Pseudo tumor - myofibroblastic tumour. Patient is under followup.

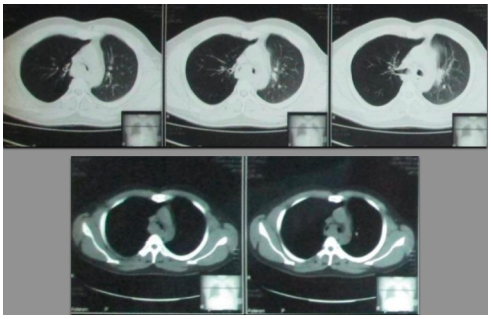

Fig 1 - Tumor at the level of carina partially obstructing right bronchus

Case 2

A 55 yr old male came with progressive breathlessness and complaints of Hemoptysis for 6 months and CT showed Ill defined heterogenous mass arising from anterior and lateral wall of lower trachea at D3 level measuring 1.2 x 1.4 cm no evidence of extra tracheal extension. The lesion lies 7.53 cm below vocFig 1 - Tumor at the level of carina partially obstructing right bronchus al cords and 3.54 cm above carina.

Patient in supine position, intubated with single lumen tube, median sternotomy done. Pericardium dissected, space between innominate vein, SVC, RPA and Aorta was dissected. Lower mediastinal trachea reached. By bronchoscopy [1,2] using same technique as mentioned in case 1 the tumor was found to be posterior to innominate vein, about 4.5 cm from carina. Stay sutures were taken superiorly and inferiorly using 3-0 Vicryl. Incision over anterior wall of trachea made distal to the growth.suctioning done in lower part of trachea and bronchii. 7.5 Fr flexometallic ET tube was inserted to lower part of trachea and cross-field ventilation carried out. Upper border of tumor was marked and trachea was excised along with tumor.Neck flexed.Tracheal anastamoisis done using 4-0 prolene continuous suture [10]and 2-0 ethibond intermittent suture. Procedure done as same as case 1. Mediastinal tissue was placed between innominate vein and trachea.The difficulty was in handling instruments behind innominate vein and care was taken not to injure it. Anastamosis checked for air-leak. Tumor was Cauliflower shaped growth of size 2 x 2 x 1.6 cm attached to the anterior and lateral wall of trachea. Mediastinal drain was placed. Chest closed in layers after hemostasis. Chin stitch placed[13]. Flexible bronchoscopy done, bronchus and trachea suctioning done. Patient extubated on table. There were no post op complications. Chin stitch was removed on 5th post op day[9]. Biopsy resulted as Adenoid cystic carcinoma. Patient was referred to Radiation oncology and underwent 3 cycles of radiation[7,10,11,13] and is on followup.

DISCUSSION:

Tracheal tumors are rare[1,8]. Most common of them are squamous cell carcinoma and adenoid cystic carcinoma[3]. ACC is a slow growing tumor with peak incidence in fifth decade[11] presents as a polypoid lesion or infiltrating growth on the tracheal wall with [3,7,10]. Patients usually present with breathlessness, cough & hemoptysis and initially get diagnosed as asthma and undergo treatment for the same[3,7,8,13]. Due to gradual progression of disease and the obstruction of lumen, patient develops breathlessness at rest, wheeze, hoarseness and stridor and end up in airway obstruction which may be life threatening.[3, 6,7] In case no 1 the patient developed mild stridor and underwent rigid bronchoscopy[12] and tumor debulking to relieve of symptoms and to get histological diagnosis.some may develop recurrent pulmonary infection from distal obstruction [3]and emphysematous changes in lung parenchyma. Both our cases were initially treated for asthma [6,8] and for recurrent respiratory infections[7,8].case no 2 had been investigated and evaluated for tuberculosis prior to admission since he had hemoptysis.

Diagnostic workup:

Chest X-ray erect is most common imaging study done in patients with respiratory symptoms[3].For tracheal lesions, chest X-ray lateral view will give a better perspective. Computed tomography of Neck and Chest gives more information regarding depth of invasion, intra and extra luminal extension, involvement of adjacent structures, lymph-node involvement and distant metastasis.[3] Positron Emission Tomography is more useful in cancer staging, evaluate on location of primary, local and distant metastasis. [3]

Fibre optic Bronchoscopy / Rigid bronchoscopy gives us the idea about the vocal cord status, position of tracheal lesion: its distance from vocal cords/ incissor tooth and carina. Intra luminal extension, and helps in taking biopsy for histological diagnosis. [3]. Diagnostic delay occurs because of misdiagnosis.

Anesthesia:

The anesthesiologists play a vital and demanding role in this surgery as trachio- bronchial tumors are a challenge when it comes to securing and maintaining the airway, maintaining adequate ventilation and oxygenation - whether single lung or dual lung ventilation, providing adequate anesthesia during surgery and analgesia during and post surgery[4]. discussion days prior surgery is a must to avoid surprises. [4] In both of our cases we intubated and ventilated with single lumen endotracheal tube which were placed superior to the tumors and cross field ventilation [1,4,5,9] with flexometallic ET tube after trachea was excised. In first case single lung ventilation was done on left lung, in the second case dual lung ventilation was carried out. We did not move the trans oral ET tube to facilitate cross field ventilation as described in various papers,during posterior wall anastamosis, ventilation was done intermittently while keeping a keen watch on peripheral saturation and periodic arterial and venous blood gas analysis [4,9,14].both patients were extubated on table and received epidural analgesia for 24 hrs.

Surgery:

Tracheal resection and anastamosis remains the treatment of choice for tracheal tumors. [3,8,12,13]The main contraindications for surgery are length of the tumor which may not allow tension free anastamosis, [13] un-resectable tumors with extensive local infiltration and distant metastasis, severe co-morbidities like diabetes mellitus and nutritional impairment [3] . Planning of surgical procedure depends on surgical approach, site and extent of tumor, resectability, length of proximal and distal ends of trachea that would remain for tension free anastamosis. History of radiotheraphy [3]Neck flexion was done [5].Traction sutures of 3-0 vicryl were placed at 3-o' clock and 6-o' clock position on proximal and distal ends of trachea[5] . Proximal and distal airways were suctioned out of blood and debris as soon as tracheal resection is done and intermittently during anastamosis [5] Tracheal anastamosis was done using 4-0 prolene in continuous fashion [10] from 6-o clock to 3-o clock and from 6-o clock to 9-o clock position, only allowing two intermittent sutures by 2-0 ethibond. After thorough suctioning, two seperate 4-0 prolene continuous sutures were used for 3-o clock and 6-o clock to 12 -o clock positions. For Lower trachea, mediastinal drains and pleuropericardial drains are usually placed. After closure of chest, chin stitch is usually placed near submental crease to presternal skin usually at the level of second intercostal space[1,14]

Post op management:

Patient were given I.V antibiotics for 5 days and i.V analgesics for three days. Ryles Tube feeds started on 2nd POD. Orals were started on 3rd POD for case 1 and 4th POD for case 2. Neck was kept flexed for 7 days for case 1 and 5 days for case 2. Tracheo bronchial toileting was done on 3rd & 5th POD for both patients Benign Inflammatory Pseudo tumor - myofibroblastic tumour is a rare tumor most commonly seen in children and young adults [15] .Tracheobroncheal pseudo tumor presents as a heterogenous lobulated or exophytic endoluminal mass [15].

Adenoid cystic carcinoma have low grade malignancy. It has a prolonged clinical course [10],Post op radiotheraphy is

advised for many cases [2,7,10,11,13] .Complete resection good results in long term [8,11]

REFERENCES:

1) Sabiston and Spencer - Surgery of the chest 9th edition
2) Shields - General Thoracic Surgery 7th edition
3) Federico Rea, Andrea Zuin (2016) Tracheal resection and reconstruction for malignant disease , J Thorac Dis 2016;8(Suppl 2):S148-S152 , doi: 10.3978/j.issn.2072-1439.2016.02.04
4) Sankalp Sehgal, Joshua C. Chance, and Matthew A. Steliga (2014) Thoracic Anesthesia and Cross Field Ventilation for Tracheobronchial Injuries: A Challenge for Anesthesiologists , doi: 10.1155/2014/972762
5) Mark S. Allen, M.D (2015) Surgery of the Trachea , doi:10.5090/kjtcs.2015.48.4.231
6) Paul A. Ebert, M.D., and William P. Cornell, M.D. (1966) Surgical Excision of a Primary Carcinoma of the Trachea , The Annals of Thoracic Surgery Vol2, No.6 Nov., 1966 823-826
7) Le-Tian Xu, M.D., Zhen-Fu Sun, M.D., Ze-Jian Li, M.D., Lian-Hong Wu, M.D., Zhi-Young Zhang, M.D., and Xung-Quan Yu, M.D. (1987) Clinical and Pathologic Characteristics in Patients with TracheobronchialTumor: Report of 50 Patients , Annals of Thoracic Surgery , Vol 43: No 3 Mar 1987 276-278,
8) Xu Le-Tian, M.D., Sun Zhen-Fu, M.D., Li Ze-Jian, M.D., Wu Lian Hun, M.D., and Wang Zhi Zhong, M.D.(1983) TracheobronchialTumors: An Eighteen-Year Series from Capital Hospital, Peking, China , Annals of Thoracic Surgery, Vol 35: No 6 Jun 1983 590-596
9) D. A. C. Sharpe K. Moghissi (1996) Tracheal resection and reconstruction: a review of 82 patients , European Journal Of Cardiothoracic Surgery (1996) 10:1040-1046
10) Wenjie Jiao, MD, Dezhang Zhu, MD,Zhaozhong Cheng, MD, and Yandong Zhao, MD(2015) Thoracoscopic Tracheal Resection and Reconstruction for Adenoid Cystic Carcinoma Annals of thoracic surgery doi: 10.1016/J.athoracsur.2014.06.118
11) Hermes C. Grillo, MD, and Douglas J. Mathisen, MD (1990) Primary Tracheal Tumors: Treatment and Results Annals of Thoracic Surgery 1990;49:69-77)
12) Paul Schneider, Joachim Schirren, Thomas Muley, Ingolf Vogt-Moykopf (2001) Primary tracheal tumors: experience with 14 resected patients European Journal of Cardio-thoracic Surgery 20 (2001) 12-18
13) Yael Refaely, MD, and Dov Weissberg, MD(1997) Surgical Management of Tracheal Tumors Ann Thorac Surg 1997;64:1429–1433
14) Douglas J. Mathisen, MD (2017) Tracheal Resection and Reconstruction: How I Teach It doi:10.1016/J.athoracsur.2016.12.057
15) Madhavi Patnana, Alexander B. Sevrukov, Khaled M. Elsayes, Chitra Viswanathan, Meghan Lubner, Christine O. Menias (2011), Inflammatory Pseudotumor: The Great Mimicker , DOI:10.2214/AJR.11.7288