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3

4 **Abstract**

5 Thoracic ganglioneuromas are a rare entity but can be aggressive, compressing, or invading
6 nearby mediastinal structures. Hence surgical intervention is necessary when
7 diagnosed. Introduction: Ganglioneuromas are benign neurogenic tumors that arise from
8 sympathetic ganglions and are most commonly found in teenagers and young adults. They are
9 usually asymptomatic and sometimes diagnosed by chance. The procedure of choice is
10 Surgical removal. We had a forty-year-old lady who present with cough and expectoration for
11 the last three months. Left anterolateral thoracotomy was performed with access through the
12 fifth intercostal space. Intraoperatively there was evidence of a mass densely adherent to left
13 subclavian vessels, hence had to be compromised. The left subclavian vein was ligated. Left
14 subclavian artery approximated with Autologous Interposition Saphenous Vein Graft.
15 Histologic examination findings are consistent with Ganglioneuroma.

16

17 *Index terms*—

18 **1 Introduction**

19 anglioneuromas are benign neurogenic tumors that arise from sympathetic ganglions and are most commonly
20 found in teenagers and young adults. They are usually asymptomatic and sometimes diagnosed by chance. The
21 procedure of choice is Surgical removal. However, it has been proposed that the risks and consequences of this
22 method may outweigh the advantages.

23 **2 II.**

24 **3 Case Presentation**

25 A forty-year-old lady presented with cough and expectoration for the last three months. No other constitutional
26 symptoms were present. There was no history of lung cancer among family members. Vitally she was stable. On
27 Clinical examination patient had dullness and reduced breath sounds over the left infraclavicular region.

28 **4 III.**

29 **5 Investigation**

30 Antero-posterior and Lateral view Chest X-ray revealed a large well defined homogenous radio-opacity in the left
31 upper and part of the mid-zone. Her CECT Chest showed a large well-defined peripherally enhancing cystic lesion
32 noted in the left upper lobe measuring approximately 10x9.5x8.7cm (CCxTRxAP). The lesion is seen adjacent
33 to the arch of the aorta with well-maintained fat planes; likely? Large cyst and which showed no evidence of
34 invasion into lung parenchyma, mediastinum, or the chest wall. But lesion near to the left subclavian vessels.
35 Pulmonary function tests revealed an obstructive lung disease.

36 USG guided Trucut biopsy shows linear tissue bit showing spindle cells with spindle nuclei along with few
37 ganglion cells suggestive of Ganglioneuroma.

38 **IV.**

39 **6 Treatment**

40 Surgery is the preferred treatment for benign tumors of the posterior mediastinum. Although these tumours are
41 histologically benign, they can be aggressive, compressing, or invading nearby mediastinal structures. Given this

42 potential, these tumors are resected. Ganglioneuroma has a near-zero recurrence rate, and surgical complications
43 are uncommon. [1] Left anterolateral thoracotomy was performed with access through the fifth intercostal space.
44 Intraoperatively there was evidence of a wellencapsulated mass, slightly adherent to upper lobe of left lung,
45 compressing it. We identified dense adhesions between apex of the mass, and left subclavian vessels, 1 st and
46 2 nd rib. En-mass resection was relatively arduous, the decision was taken to carry out piecemeal excision.
47 The mass was 12x10x8 cm in size. Mass was densely adherent to left subclavian vessels, hence had to be
48 compromised. The Left subclavian vein was ligated. Left subclavian artery approximated with Autologous
49 Interposition Saphenous Vein Graft. After removal of the tumor, the lung was ventilated, and expansion was
50 observed. Two Intercostal drainage tubes were placed, one for the apex and the other for the left lung base.
51 Excised specimen was well encapsulated and had fibrous nodule with cut sections showing whitish gelatinous
52 tissue. On histologic examination, tumor tissue comprising of spindle cells arranged in myxoid background.
53 Ganglion cells are found in groups and scattered, consistent with Ganglioneuroma. The postoperative course of
54 the patient was uneventful.

55 V.

7 Discussion

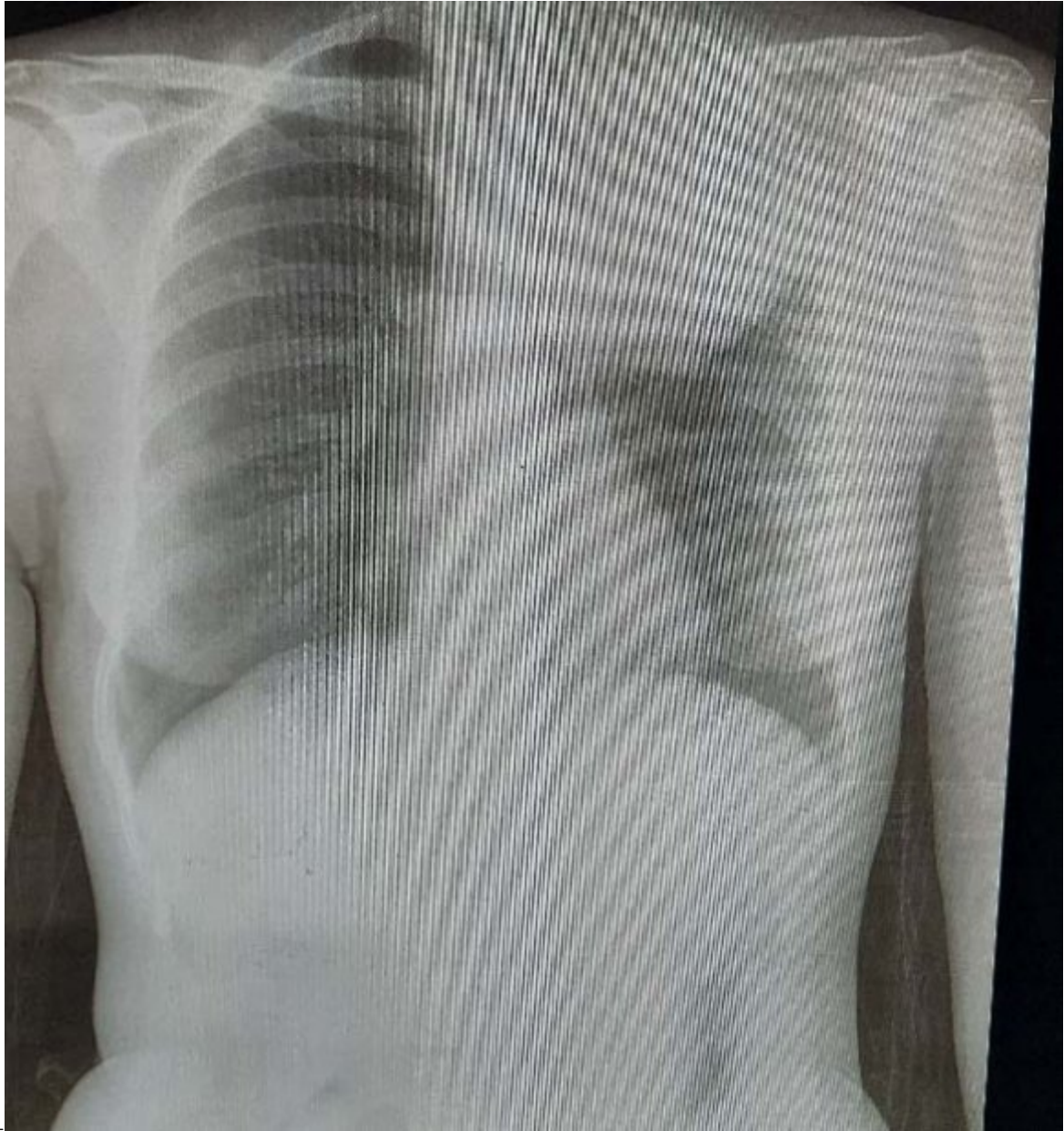
57 Peripheral Ganglioneuroma is a benign, slowgrowing tumor with a well-differentiated appearance. It can appear
58 everywhere from the base of the skull to the pelvis, but the posterior mediastinum (41.5 percent) is the most
59 common site, followed by the retroperitoneum (37.5 percent), the adrenal gland (21 percent), and the neck
60 (8 percent) [2] [3] Thoracic Ganglioneuromas (TGs) are generally discovered as incidental findings. Thoracic
61 ganglioneuromas may present with symptoms due to mass effect as seen in our patient. TGs have also been
62 reported to present with symptoms of spondylodiscitis. [4] The largest ganglioneuroma in the lungs reported is
63 23x10x10cm [1]. They usually do not infiltrate nearby structures; however, it has been observed that they can
64 adhere to the vertebral bodies [9] or even involve the spinal column [5], [6], [7].

65 The imaging features of 14 pathologically established ganglioneuromas on CT were identified by Kato et al.,
66 who found that ganglioneuromas were often well-delineated lesions with oval or lobulated contours and showed
67 craniocaudal longitudinal growth with low attenuation on CT. [8] On CT, our case showed a well delineated
68 homogenous lesion with low attenuation with a postcontrast density. However, there was no calcification, fat
69 content density, or significant enhancement.

70 Surgery is the definitive treatment for Thoracic Ganglioneuromas [5,9,10] Fluid shifts and sudden pulmonary
71 edema can occur when big intrathoracic bodies are removed. After decompression of a chronically compressed
72 lung, patients could have re-expansion pulmonary edema [11][12][13]. Surgeons must also be cautious not to
73 disturb the sympathetic trunk, a rare condition that can cause various problems, including Harlequin syndrome
74 [7]. [14] In our patient, the mass was densely adherent to left subclavian vessels, hence had to be compromised,
75 which required autologous reverse saphenous vein graft and patient is recovered with relatively negligible post-
76 operative complications [15, ??6] VI.

8 Conclusion

78 Although thoracic ganglioneuromas are rare, clinicians should be aware of them and consider them in the
79 differential diagnosis when necessary. If thoracic ganglioneuromas grow significantly, they can induce compressive
80 symptoms and parenchymal damage. Most of these masses are benign and complete excision of TG is usually
81 safe and achievable. Preventing local extension, obtaining a histological diagnosis, preventing malignant
82 transformation, and determining the need for subsequent therapy are the goals of surgical removal. [17]A
83 combination video-thoracoscopic and neurosurgical approach is required for the dumbbell variety of neurogenic
84 tumours with extension into the spinal canal. [5] Estimation of surgical risk factors based on radiological
85 investigations is useful when planning TG operations. Because of the mass's proximity to the aorta, left
86 pulmonary artery, and left subclavian vessels, a thoracotomy was the safest option because it allowed for the
87 prompt intervention of an operating complication. Large intrathoracic masses necessitate special consideration
88 during the postoperative period to avoid fluid shifts and hemodynamic instability [12,13]. The high mortality rate
89 of this event necessitates careful surveillance in the postoperative phase. Surgeons must also avoid disrupting the
90 sympathetic trunk, which can result in a variety of problems, including Harlequin syndrome, which is characterized
91 by asymmetric sweating, and flushing on the upper thoracic region of the chest, neck and face [14] ¹



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Figure 1: Figure 1 :

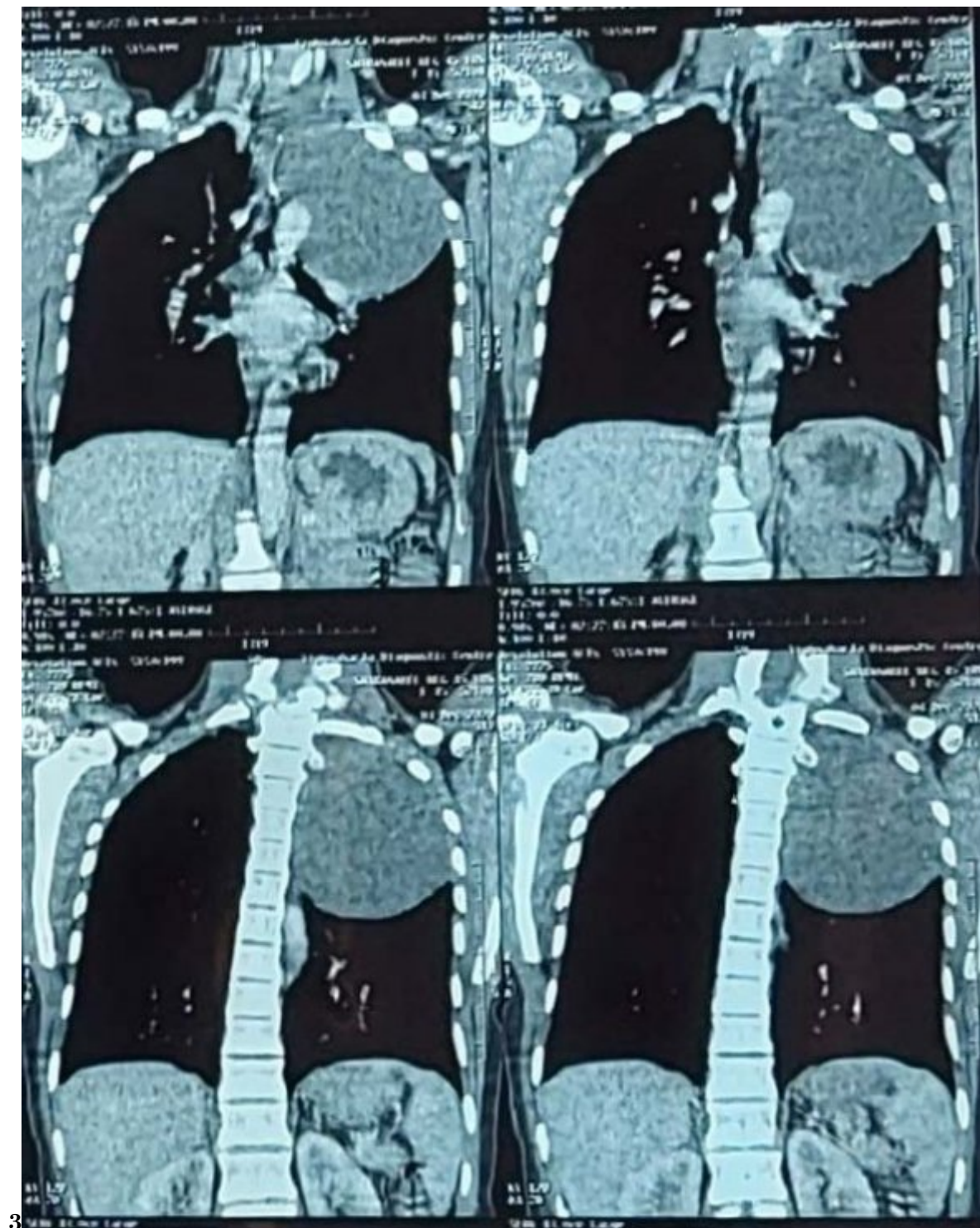
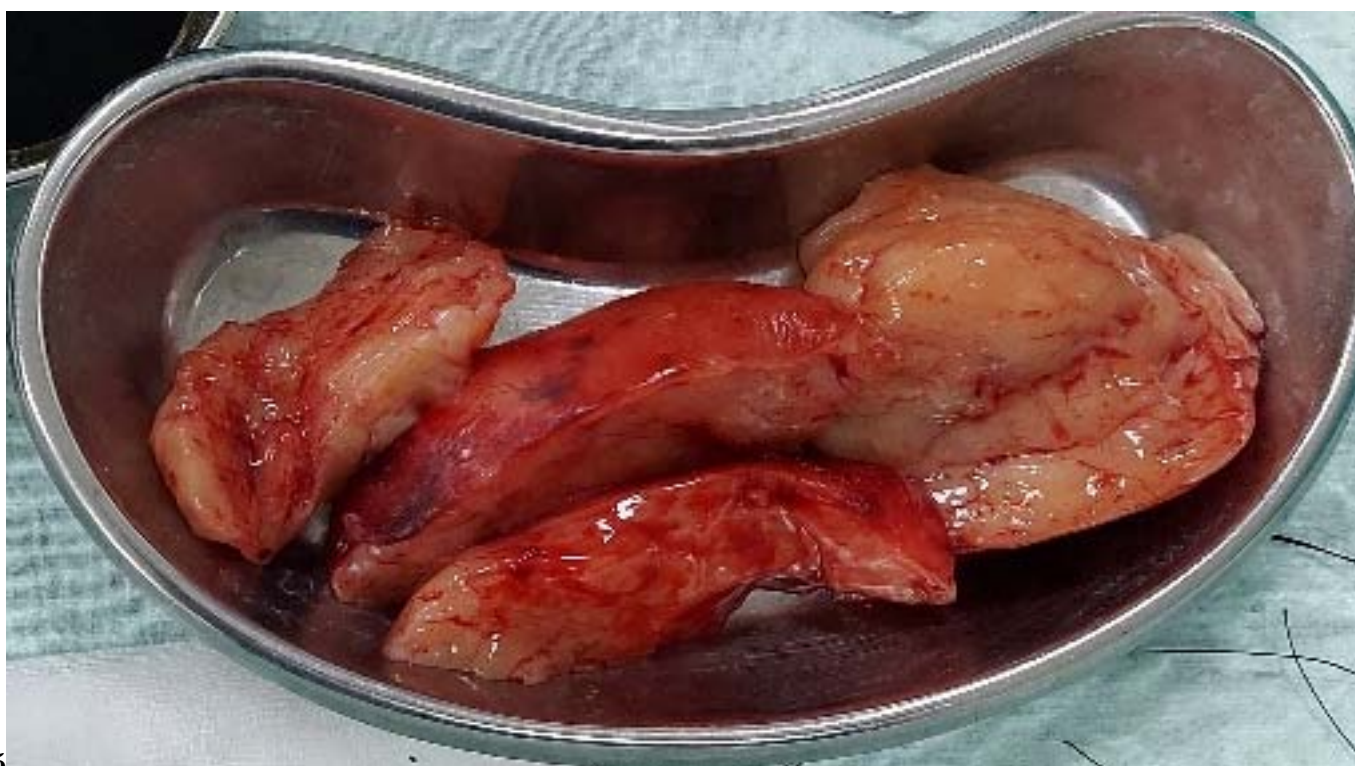


Figure 2: Figure 3 :



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Figure 3: Figure 4 :



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Figure 4: Figure 5 :

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- 92 [Forsythe et al.] , A Forsythe , J Volpe , R Muller . (Posterior Mediastinal Ganglioneuroma 1 n.d)
- 93 [Chakraborty and Chakraborty ()] , P P Chakraborty , S Chakraborty . *Reexpansion Pulmonary Edema. Indian*
94 *Journal of Surgery* 2012. 74 p. .
- 95 [Marone et al. ()] ‘A novel technique of upper extremity revascularization: The retrohumeral approach’. L
96 Marone , G Nigri , G M Lamuraglia . *Journal of Vascular Surgery* 2002. 35 p. .
- 97 [Chen et al. ()] ‘Bone invasion of retro-peritoneal ganglioneuroma detected by bone scan but not by computed
98 tomography: a case report’. Y-H Chen , Y-C Tsai , Yen , C-H Lai , C-W Shiau , Y-C . *Ann Nucl Med Sci*
99 2008. 21 p. .
- 100 [Assadi et al.] ‘Case report B3 Extradural ganglioneuroma with T1-T2 involvement mimicking spondylodiscitis:
101 a case report and a review of the literature’. M Assadi , M Mogharrabi , R Azarhoush , H Javadi , E Pirayesh
102 . *Nuclear Medicine Review* 2016 p. .
- 103 [M K ()] ‘Computed tomography and magnetic resonance imaging features of posterior mediastinal ganglioneu-
104 roma’. M K , M H , Y O , S S , Y . *Journal of Thoracic Imaging* 2012. 27 p. .
- 105 [Mounasamy et al. ()] ‘Ganglioneuromas of the sacrum -A report of two cases with radiologicpathologic correla-
106 tion’. V Mounasamy , M M Thacker , S Humble , M E Azouz , J D Pitcher , S P Scully . *Skeletal Radiology*
107 2006. 35 p. .
- 108 [Zhang et al. ()] ‘Giant cervicothoracic ganglioneuroma’. J Zhang , J Li , R Shrestha , S Jiang . *Neurology India*
109 2011. 59 p. .
- 110 [Huang et al. ()] ‘Giant ganglioneuroma of thoracic spine: A case report and review of literature’. Y Huang , L
111 Liu , Q Li , S Zhang . *Journal of Korean Neurosurgical Society* 2017. 60 p. .
- 112 [Jeon et al. ()] ‘Harlequin syndrome following resection of mediastinal ganglioneuroma’. Y J Jeon , J Son , J H
113 Cho . *Korean Journal of Thoracic and Cardiovascular Surgery* 2017. 50 p. .
- 114 [Bicakcioglu et al. ()] ‘Intrathoracic neurogenic tumors’. P Bicakcioglu , F Demirag , A Yazicioglu , K Aydogdu
115 , S Kaya , N Karaoglanoglu . *Thoracic and Cardiovascular Surgeon* 2014. 62 p. .
- 116 [Nakazono et al. ()] ‘MRI findings of mediastinal neurogenic tumors’. T Nakazono , C S White , F Yamasaki ,
117 K Yamaguchi , R Egashira , H Irie . *American Journal of Roentgenology* 2011. 197.
- 118 [Mahfood et al. ()] ‘Reexpansion Pulmonary Edema’. S Mahfood , W R Hix , B L Aaron , P Blaes , D C Watson
119 . *Annals of Thoracic Surgery* 1988. 45 p. .
- 120 [Sohara ()] *Reexpansion Pulmonary Edema*, Y Sohara . 2008. 14.
- 121 [Saudi] *review SAPHENOUS VEIN GRAFTING 63*, A Saudi .
- 122 [Fraga et al. ()] ‘Surgical treatment for pediatric mediastinal neurogenic tumors’. J C Fraga , B Aydogdu , R
123 Aufieri , Gvm Silva , L Schopf , E Takamatu . *Annals of Thoracic Surgery* 2010. 90 p. .
- 124 [Cardillo et al. ()] *Surgical treatment of benign neurogenic tumours of the mediastinum: a single institution*
125 *report*, G Cardillo , F Carleo , M W Khalil , L Carbone , S Treggiari , L Salvadori . 2008.