Azygos Lobe: A Difficulty in Video-Assisted Thoracic Sympathectomy

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The presence of an azygos lobe (AL) may make it difficult or even impossible to use video-assisted thoracic sympathectomy if the surgeon is unprepared to deal with this anatomical anomaly. Seven hyperhidrosis patients with an AL from a total of 1,876 individuals who underwent video-assisted thoracic sympathectomy are presented. The surgical technique and clinical evolution are described. For these 7 patients, the surgical intervention could be performed using thoracoscopy. Only 1 patient required postoperative pleural drainage. Another patient presented atelectasis in part of the AL, which was resolved through respiratory physiotherapy. For all of them, the operation was completely successful. We concluded that it is possible to successfully perform VATS in the presence of an AL. Previous knowledge of the presence of AL is useful, so that surgeons are not taken by surprise during the operation.

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The azygos lobe (AL) is an accessory lobe located in the apex of the lung. This is an infrequent anatomical variation among the population [1] that may cause notable morphologic changes in the upper mediastinum and may constitute an obstacle to performing video-assisted thoracic sympathectomy (VATS). Its presence makes it difficult to identify the sympathetic chain and gives rise to the possibility of damaging the azygos vein [2].

Only 5 articles describe this anatomical variation in samples of patients who underwent VATS [2–6]. These reports do not describe the surgical technique for sympathectomy in detail.

The aim of the present study was to present seven cases of VATS in the presence of an AL, with descriptions of the surgical technique used.

Technique

Of 1,876 patients with hyperhidrosis who underwent VATS, AL was found in 7 (0.37%). In 5 of them, preoperative diagnosis was made by roentgenogram (Fig 1). In 1 of these cases, complementary tomography was performed (Fig 2). In the other 2 cases, the AL was found intraoperatively. The age of the patients ranged from 16 to 27 years (mean, 20 years) and 5 were male.

Patients underwent general anesthesia in a semi-seated position at 45° using double lumen intubation. In 5 patients, 2 mini-incisions of approximately 5.5 mm each were made: the first into the fourth intercostal space on the anterior axillary line (for the video camera), and the second into the second intercostal space on the mid-axillary line (for the scalpel).

Five patients underwent sympathectomy at the third ganglion (for palmar hyperhidrosis), one at the fourth ganglion (for axillary hyperhidrosis), and one at the third and fourth ganglia (for both axillary and palmar hyperhidrosis). In two cases, because of extensive and firm pleural adhesion, a third incision was made.

At the start of the operation, AL was identified in all of the cases (a lobe separated from the upper pulmonary lobe). The arcuate vein was located anteriorly, and its entrance was at the superior vena cava. A covering or curtain of pleura separated these two lobes (Fig 3A). This was a structure similar to the mesentery (derived from the mediastinal pleura). At its base, it covered the sympathetic chain between the second and fourth thoracic ganglia in almost all cases. The third ganglion was the most difficult one to identify.

When there were no venous tributaries in the curtain, it was either opened or a window was created to expose the sympathetic chain better (Fig 3B). The sympathetic chain thermoablation was then used. When there were intercostal descending veins inside this curtain, some of these veins had to be ligated before the sympathetic chain could be exposed. One alternative would be to ligate the azygos vein to obtain this exposure, although this was not needed in any of our cases. It has to be borne in mind that the azygos vein is a very fragile structure, with a very thin wall and considerable blood flow; therefore, it has to be pushed aside or ligated with extreme caution.

At the end of this procedure, while the anesthetist

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re-expanded the lung, we monitored on video the repositioning of the AL back to its original location. The repositioning was assisted, or guided using forceps, or both, to ensure complete expansion and avoid rotation or atelectasis of this accessory lobe or part of it. Rotation or atelectasis could cause a predisposition toward accumulation of secretions or toward infection, which in turn could complicate the postoperative evolution. Curiously, some lobes occupy a large space, and the air present at this site may itself impede correct repositioning to the original location. Under such circumstances, a small opening in the membrane reflected from the mediastinal pleura may facilitate the outflow of air and make it easier to reposition the AL into its original location. This maneuver was necessary in 1 of our patients.

Despite the difficulties, it was possible to conclude VATS in all of the patients, without conversion to an open thoracotomy and no intraoperative complications. For 1 patient with extensive pleural adhesion and a small air fistula, pleural drainage was necessary during the immediate postoperative period. One patient presented partial atelectasis of the AL during the immediate postoperative period, treated successfully by means of respiratory physiotherapy. Anhydrosis and full satisfaction was achieved for all the patients. No changes in pulmonary function were observed.

Comment

The AL results from a failure of the normal migration of the azygos vein from the thoracic wall to its usual position at the tracheobronchial angle, such that the laminae of the parietal and visceral pleura remain invaginated, thus forming a “tent” with the azygos vein at its base [3].

The preoperative diagnosis can be made by a chest roentgenogram. In cases of doubt, computed tomography can be used. Identification in advance will alert the surgeon to the potential risk that it represents.

In the presence of an AL, the sympathetic chain is
partially or totally obscured, thus making it difficult to accomplish the surgical procedure. For good viewing, intubation using a double-lumen probe is the most appropriate choice, because this allows greater reduction of the lung volume. Despite the difficulties encountered, the objective was achieved for all 7 patients.

At the end of VATS, it is important to check whether the AL has gone back to its original location. If it expands outside of its original location, there is a possibility of atelectasis, which may favor postoperative pneumonia.

In conclusion, it is possible to successfully perform video-assisted thoracic sympathectomy in the presence of an AL. Previous knowledge of the presence of this anatomical variation is useful so that surgeons are not taken by surprise during the operation.

References