



CASE STUDY

THORACOSCOPIC THYMECTOMY

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ARTICLE INFO

Article History:

Received 23rd September, 2016
Received in revised form
20th October, 2016
Accepted 29th November, 2016
Published online 30th December, 2016

Key words:

Myasthenia gravis,
Thoracoscopically.

ABSTRACT

Myasthenia gravis caused by a tumor in the thymus is potentially curable. We present a case report of a young girl who was diagnosed to have myasthenia gravis due to thymictumor which was removed thoracoscopically. She had a stormy post-operative period with repeated intubation and ventilatory support caused by circulating antibodies for which she required plasmapheresis. She made a complete recovery. In this article, we highlight the technical aspects of thoracoscopy and the need for post-operative plasmapheresis to tackle the circulating antibodies.

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Citation: Rajkumar, J. S., Avvai, T., Anirudh Rajkumar, Akbar Syed, Venkatesan Guru, Prabhakaran Raju and Deepa Ganesh, 2016. "Thoracoscopic thymectomy", *International Journal of Current Research*, 8, (12), 43618-43621.

INTRODUCTION

A 19 year old female presented with multiple falls in college, and increasing difficulty in keeping her eyelids open. She said that her altered drooping eyelid appearance had raised a few eyebrows. She was worked up, and thyroid function test, adrenal function test, and complete general parameters including blood counts, liver function test etc., were found to be normal. Further workup was highly suggestive of myasthenia gravis and a chest x-ray showed superior mediastinal widening. This was followed by a CT scan that revealed a large 6x5cm anterior mediastinal mass (?thymoma) arising from the right lobe of the thymus, and a minimally enlarged left lobe of thymus. A CT guided needle biopsy was performed, and this confirmed the presence of right lobe thymoma in the superior mediastinum.

CT guided needle biopsy

She was started on long acting cholinesterase inhibitors, and was reasonably stable for two weeks before she presented to this surgical department. After completing the pre-operative workup, we discussed with the parents about various options, and offered both the VATS (Video Assisted Thoracoscopic Surgery) (Landreneau et al., 1992) option as well as the

midline sternotomy option. They opted for VATS option, and we therefore proceeded with the thoracoscopic thymectomy (Zahid et al., 2011) as follows:

Technique

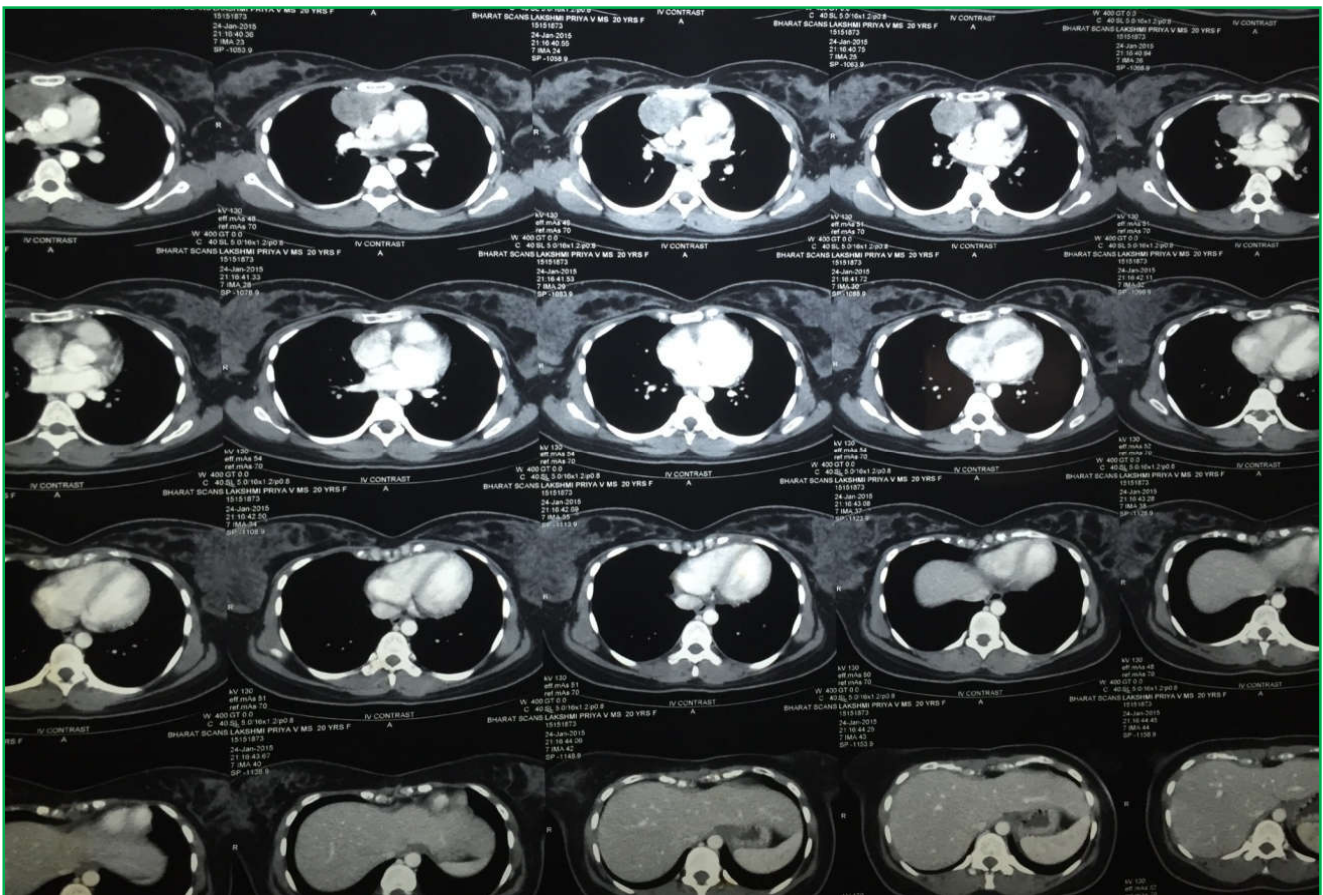
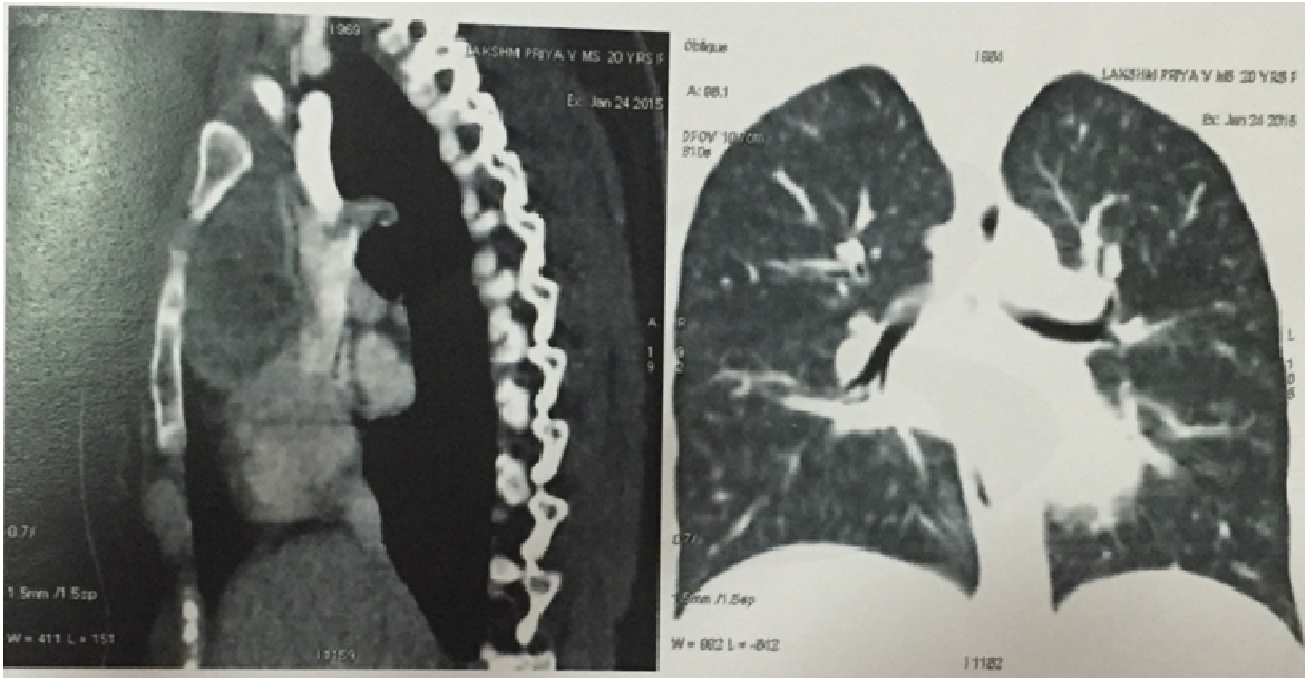
Through 3 ports in the right anterior chest (4th, 5th and 6th intercostal spaces, 5th intercostal space just beyond the mid clavicular line and 4th and 6th ports being situated 1cm anterior to the first optical port, we proceeded to explore the chest thoracoscopically. The patient was in supine position with the left half of the chest being elevated and the head end been elevated. We approached the superior mediastinum by visualizing the right phrenic nerve and its passage by the SVC. The SVC was traced to its entry into the right atrium, and dissection was begun at the cavo-atrial junction to gently mobilize the enlarged thymus and thymoma away from the pericardium. This plane was continued superiorly and inferiorly, using the ultrasonic shears, when the deep edge of the thymus (left side) was reached the left phrenic nerve was visualized. Thus, the operative field was the complete interphrenic nerve area. Multiple small thymic veins were clipped and divided and the thymic arteries were also taken as they entered the capsule of the gland, then the entire left lobe, was also completely mobilized and removed. Perfect hemostasis obtained, the specimen was put into a plastic bag, and removed through by extending one of the ports in the right chest, situated in the inframammary region for cosmetic reasons. The post-operative period was initially uneventful,

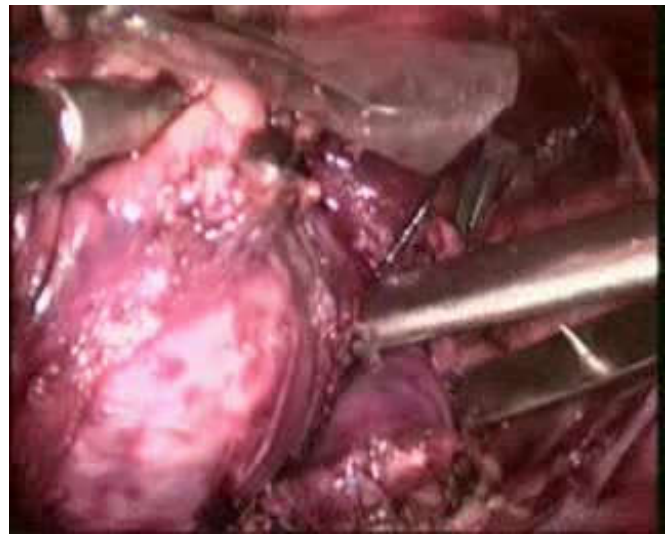
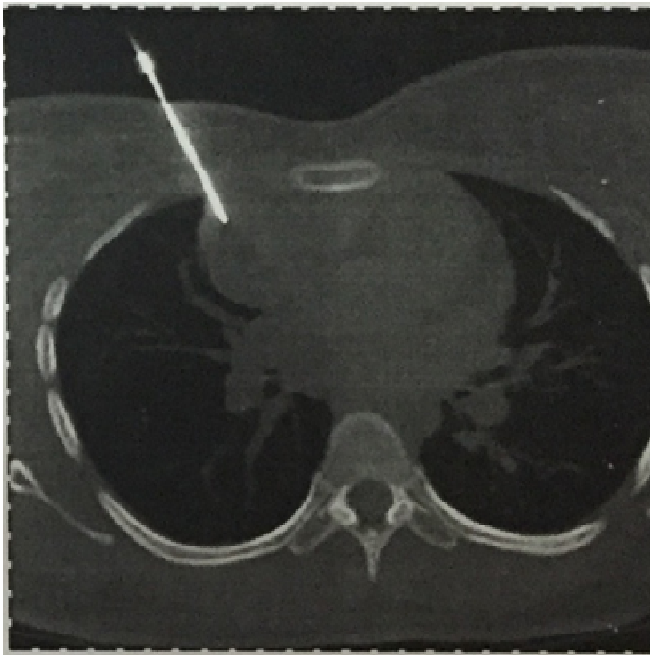
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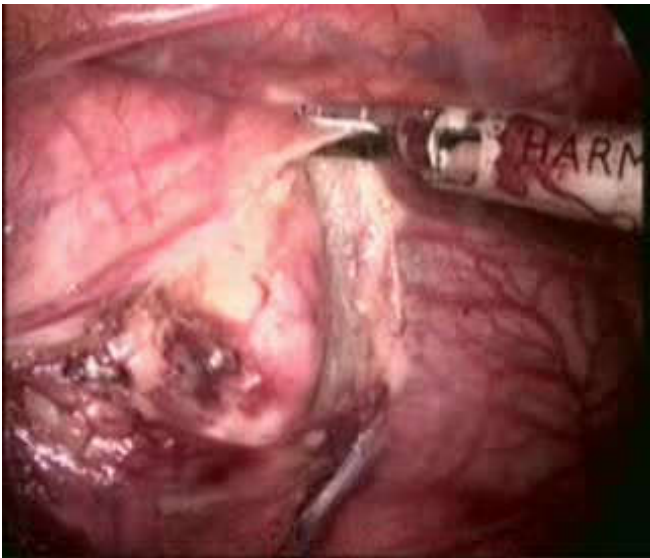
but on the 5th post-operative day, the patient had to be reintubated and ventilated to prevent as she was not making enough respiratory effort. She was successfully weaned off the ventilator on the 9th post-operative day, and extubated. However, once more by the 11th post-operative day she had to reintubated and ventilated, as her respiratory efforts were insufficient, and she was progressively developing desaturation. At this point of time, we discussed with the endocrinologist and the intensivist about the need for

plasmapheresis. As some patients with thymoma have longer acting anti neuromuscular junction antibodies, we felt it might be worthwhile to proceed with the plasmapheresis in order to clear the antibodies from the serum. Accordingly, the plasmapheresis was performed, and the patient was extubated on the 12th post-operative day, with excellent respiratory effort, and had no further problem. The histopathology confirmed thymoma with no evidence of malignancy.





Specimen extraction



Dissection from Cavo-atrial plane



Freeing the lobe



DISCUSSION

Myasthenia gravis is either idiopathic or may occur due to a number of causes, and an eminently curable one being thymoma³. It is well known that removal of the thymus tends

to have nearly a 100% cure for myasthenia gravis in those cases with an associated thymoma (Buckingham *et al.*, 1976). In this aspect, it is good to revisit the amount of thymus to be removed in such a disease. There is a small proportion of recurrence when the thymoma or that lobe alone is removed (Kirschner, 1990). The current recommendation is to try to decrease patient recurrence by a total thymectomy, irrespective of which lobe the thymoma arises in (Kirschner, 1990). That being agreed upon, which is the best way to remove the thymoma? Several studies have shown that the thoracoscopic thymectomy is an elegant minimal invasive alternative to the mutilating mid line sternotomy thymectomy which cardiothoracic surgeon do routinely (Hiratsuka *et al.*, 2006). The optical magnification of the laparoscope allows the surgeon to dissect out the thymus from its dangerous vascular bed, in particular SVC and the pericardium over the right atrium. Also, small but high flow thymic veins can be carefully dissected out, clipped or ligated and then divided. Preservation of the both phrenic nerves has been the dictum rather than the exception in the reported cases of thoracoscopic thymectomy (Mineo *et al.*, 2000). Which side to choose? As the thymoma was in the right lobe of the thymus we opted for the right chest approach, which is, indeed, the recommended approach. For the ports, we chose one port in the sub mammaryfold, so that we could enlarge that port and remove thymus through the same. This was hidden by the breast of the patient, and cosmesis was an important consideration in this young woman. The ultrasonic shears proved to be a very valuable guide to dissection of the thymus from the SVC, a point mentioned by several other authors too. In the post-operative period, there was a toss-up between immunoglobulins and plasmapheresis to pull this patient out of her recurrent asthenic crisis. Fortunately, we chose plasmapheresis (Peter *et al.*, 1977) after consulting several experts in the field of endocrinology, as we were able to completely remove the plasma with its contained anticholinesterase antibodies. Presumably, these circulating antibodies were long acting and, released into the circulation before the tumor was removed.

Conclusion

A case of thoracoscopic thymectomy has been discussed, taking the technical aspects of the procedure and post-operative stormy events involving the delicate balance between anti cholinergic agents and cholinesterase into consideration. One hopes that this discussion will shed light on the matter regarding this infrequently performed procedure for a very debilitating disease. Although these are a few controversies regarding the long term outcome of thoracoscopic versus extended thymectomy (Marcin Zieliński *et al.*) the

immediate post-operative period is much more pain free and comfortable with better cosmesis for the patients undergoing the minimally invasive procedure. A newer approach in the surgical management of such cases is the uses of the Da Vinci Robot to facilitate less invasive, more accurate and more radical thoracoscopic dissection (Rea *et al.*, 2006). But with experience in VATS, the results can be nearly as good and more cost effective.

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