Robotic-Assisted Thymectomy: How Less Invasive Can We Be?

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The first International Congress on Video-Assisted Thoracic Surgery, held in January 1993 in San Antonio, TX, USA, started a new era in the management of thoracic diseases [1]. With the camera inside the chest, the huge and painful standard posterolateral thoracotomy was converted to three or four small ports and a 4–6 cm utility intercostal incision.

One of the first thoracic organs to be targeted was the thymus gland due to its position at the anterior mediastinum and the non-complicated vascular anatomy. Video-assisted thymectomy became the choice procedure for the treatment of non-thymomatous myasthenia gravis, thymic cysts, and small thymomas. The cervical approach to the thymus was almost abandoned and the full midsternotomy incision was left for tumors larger than 4 cm in diameter or for more invasive lesions. The technology continued to improve, and by 1998 the first robotic arm to be used as an extra assistant in the surgical field received approval from the U.S. Food and Drug Administration (FDA). The Zeus Robotic Surgical System (Computer Motion, Inc., Goleta, CA, USA) had a 3-dimensional camera arm that was voice commanded in addition to two operating arms for the use of surgical instruments.

In 2002, our team reported the first robotic thymectomy in Israel. The procedure was used in a 71 year old man with myasthenia gravis [2]. Unfortunately, this system had several technical problems and the video-thoracoscopic approach continued to be the preference of the majority of surgeons.

Three years later, the da Vinci® Surgical System (Intuitive Surgical Inc., Sunnyvale, CA, USA) received approval from the FDA for thoracic operations. This system has four arms, one for the camera and three others for surgical instruments that can perform all the movements of the hand inside the patient's pleural cavity. Several advantages of the robotic system, such as 3-dimensional quality of visualization, the superior maneuverability of the surgical instruments, and the filter of hand tremors, made it the best fit for surgical procedures in tiny anatomic regions, first demonstrated in radical prostatectomy and then at the anterior mediastinum were the thymus is located.

In this issue of the *Israel Medical Association Journal* (*IMAJ*) Peer et al. [3] presented findings of the first Israeli experience with this new technology in the treatment of pathologies of the thymic gland. The study comprised 22 patients with benign or malignant disease, 7 presenting with myasthenia gravis. There were no conversions to an open surgical approach. The results presented in the article do not differ from what we have seen in the literature [4,5].

The main questions on the procedure are noted when we compare robotic thymectomy to video-assisted (thoracoscopic) thymectomy. Both techniques require three to four ports. Fok et al. [6] presented a systematic review and meta-analysis of 350 patients in which there was no statistical difference in conversion to open, length of hospital stay, or postoperative pneumonia. Operational times for the robotic procedure were longer. Buentzel and colleagues [7], in their meta-analysis, showed no significant differences in surgical outcomes in the two groups.

CONCLUSIONS

The issue of the cost of the procedure should be considered. It is already known that the price of robotic thymectomy is much higher than the thoracoscopic approach. With the same postoperative results and the same level of invasiveness, our final question should be: Is it really necessary?

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