The widespread of robot in thoracic surgery: present and future

Since 2001, when robotic technology was first approved by the US Food and Drug Administration (FDA) (1), the initial targets were considered all the procedures requiring operating in tiny and/or difficult to reach spaces (such as cardiac surgery operations), where an extreme dexterity and precision of instruments are required (2). However, in the last two decades an exponential increase in utilization and acceptance of robotic technology in various surgical fields such as urology, general surgery, gynaecology and thoracic, was observed (3). Now, the majority of thoracic surgical procedures have been successfully performed by general thoracic surgeons using the robotic technology. These procedures include anatomical lung resections (4-6), excision of benign and malignant mediastinal masses (7-8), diaphragmatic plication or resection (9), oesophagectomy for malignant tumours and treatment of benign oesophageal diseases (10).

The success and the growing interest and acceptance of robotic technology stems from several reasons: (I) technical with the highly magnified 3-dimensional visualization, easy manoeuvrability and dexterity of instruments with 7 degrees of freedom, that allow difficult dissections in narrow fields, the physiological tremor filtration (6-Hz motion filter) and the easy standardization and reproducibility; (II) oncological with comparable if not superior results obtained in the field of lung and mediastinal tumours; (III) learning curve and teaching facilities: the enhanced technology, with better visualization, the intuitive system and the recently introduced dual consoles make training in robotic surgery an excellent tool with an easier and faster learning curve (11).

The actual major limitation is represented by the high fixed cost of the robotic system and the availability of only one system (da Vinci robotic platform, Intuitive Surgical, Inc., Sunnyvale, CA, USA); however, it is well known that several Companies are working on new and maybe more complex systems that could be introduced in the clinical practice in the very next future.

This collection of clinical pearls in robotic thoracic surgery give us an overview of the state of the art and the most innovative applications of robotic technology in the majority of general thoracic surgery operations. It certainly will stimulate the readers to consider the possibility to increase their skill also in this field.

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