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Case Report / Olgu Sunumu

Open versus robotic thyroidectomy: is it really a controversial choice?

Robotik tiroidektomiye karşı açık: Bu gerçekten tartışmalı bir seçim mi?

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Since its introduction by Kocker in 1878, open thyroidectomy (OT) is among the most commonly applied surgical procedures around the world. Due to its routine application, it is usually quite safe in the majority of cases. However, like every surgical procedure, it cannot be considered risk-free. In spite of the fact that many improvements in surgical skills have been reached in recent years, the same incidence of postoperative complications its inventor met in the late 19th century are largely still to be dealt with.

This is the main reason why such great enthusiasm is raised whenever a new procedure is developed. This was the case with minimally invasive video-assisted endoscopic thyroidectomy introduced during the late 90's that, despite favorable premises, did not live up to expectations.

Since 2009, the da Vinci Robot (Intuitive Surgical, Sunnyvale, California, USA) has become available to perform robotic thyroidectomy (RT) in order to increase patients approval and improve cosmetic satisfaction.

To provide the modern computer-literate, web-using patient with effective support during preoperative counseling, we decided to analyze the scientific literature to perform a comparative analysis between OT and RT.

We searched PubMed using the terms: "thyroidectomy", "robotic", "da Vinci", and "thyroid surgery". Only articles published since 2012 and comparative reviews between the two techniques were included.

We then focused on: -Operating Time, -Length of Hospital Stay (LHS), -Recurrent Laryngeal Nerve Injury (RLNI) -both temporary and permanent, -Pain, -Blood Loss, -Hematoma, -Hypocalcaemia, and -Cosmetic Satisfaction.

Comparing different works from different countries was quite taxing because each country has its own Health Care System and peculiar economic conditions, insurance policies and different levels of access to technology and facilities.

The hardest comparison was that about cosmetic satisfaction, because it deeply involves the emotional status and self-esteem of the patient. Moreover, the aesthetic parameters are specific to each culture and not easily objectifiable, and an internationally approved or recognized questionnaire it is not currently available.

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We selected three reviews which satisfied all the criteria and that respectively examined 5, 11 and 11 articles each, with a total number of 1,122, 2,376 and 1,931 patients respectively.[1-3]

The most common RT approach was robotic assisted transaxillary thyroid surgery (RATS). Two reviews[1,2] compared RATS and bilateral axillo-breast approach (BABA), but the authors did not identify any significant difference between the two procedures.

In all studies, RT was slower procedure than OT, with an average duration of approximately 42.5[1] minutes, 42.05[2] minutes and 76.6[3] minutes respectively. The studies also unanimously determined a greater satisfaction with the aesthetic outcome by patients that underwent RT and all stated that RT presented new surgical risks without defining exactly which those were (only a single article in one of the reviews[4] described two cases of brachial plexus injury).

On the other hand, divergent results were reported for LHS by each study-- shorter,[1] longer[2] and equal.[3] The conflicting data do not allow us to consider this parameter in the assessment of the two surgical approaches.

As regards the other criteria under analysis, the studies showed substantially similar long-term outcomes (>3 months) for hypocalcaemia, pain, RLNI, hematoma and blood loss with no statistically significant difference ($p>0.05$) between the techniques. Instead, according to one of the reviewers,[1] hypocalcemia and postoperative pain was increased in patients undergoing RT immediately after surgery (first 3 months), whereas RLNI occurred more often in RT according to another one.[2]

Despite its increasing popularity especially in Asia, RT remains controversial. The different North American and European body habitus and high costs (estimated at about 2 million dollars in 2010 only to buy the robot) should be considered. But what are the exact costs of RT? We have tried to assess them through the literature, searching "cost" and "management" of RT, personally asking medical sales representatives of Abmedica - that promotes and distributes the equipment, through Intuitive Surgical website (www.intuitivesurgical.it) and addressing the Hospital Technology Department of our structure. The conclusion is that nowadays-scientific literature lacks a systematic review of RT costs, while many studies covering gynecological, urological and thoracic surgery are available. In Siena da Vinci (single console) was bought in 2010 for 2,800,000€. The maintenance cost since the purchase has been 264,000€ and it has been renegotiated for 220,000€ in 2014. The expenses connected to the single use kit for each procedure are in a range of 3,000-6,000€.

Robotic thyroidectomy entails new risks not previously occurring in OT, such as brachial plexus neuropathy and tracheal injury.[5]

But even disregarding the new complications, could the only advantage of avoiding a scar - sometimes barely visible - in the neck justify its costs?

At the end of the literature data collection, we agree with Perrier:[5] "Justifying the expense in a time when demands outweigh resources obligated us to focus on outcomes. When we did that we proved that we could perform RATS but not that we should".

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