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Robotic Surgery in ENT and Head and Neck: Our institutional experience of 200 cases

Kalpana Nagpal

Indraprastha Apollo Hospitals, New Delhi, India

Abstract

With clear advantages, such as higher patient comfort, safety and shorter length of stay at hospital, Robotic surgery is becoming a preferred mode of surgery. This paper describes our clinical experience of 200 cases at department of ENT and Head and Neck surgery, Indraprastha Apollo Hospitals (IAH), New Delhi, India. From November 2016 to February 2021, we have performed 200 Robotic surgeries, with various approved indications in ENT and Head and Neck using da Vinci Si (Intuitive Surgical systems, Sunnyvale, CA, USA). We used a 30 degree angled binocular scope (12mm) with monopolar cautery in one arm and Maryland dissector (5m) in the other, with specialized retractors for gaining access. Satisfactory results were found in almost all robotic assisted surgeries. Majority of surgeries were performed for sleep apnea [TORS-Transoral Robotic Surgery] for base of tongue reduction with or without epiglottoplasty resulting in improved Apnea-Hypopnea Index (AHI) levels. We noticed significant subjective improvement with minimal complications and excellent functional outcomes. Second most frequent procedure performed was thyroidectomy via trans-axillary and retroauricular (facelift) approach and results were encouraging. Other surgeries performed were T1 and T2 laryngeal malignancies, parathyroid surgery, T1 and T2 stage tonsil and base of tongue cancer, haemangioma base of tongue, parapharyngeal mass, lingual thyroid, submandibular gland dissection, palatal tumor, chronic lingual tonsillitis and Eagle's syndrome. In our experience results of robotic surgeries are very satisfactory for both patients and surgeon. Robotic surgery has definite benefits over endoscopic and open approaches with multiple advantages and few drawbacks commonest being high consumer cost, which is a significant amount in a developing country like India. In numerous domains of surgery, recent developments in equipment and surgical techniques have made minimally invasive surgery (MIS) a well-tolerated and efficient technique. It has various advantages over traditional surgical techniques, including faster recovery, lower postoperative infection rates, less pain, improved postoperative immune function, and superior cosmetic results [1–3]. As a result, robotic-assisted surgery (RAS) has grown in popularity in a variety of surgical specialties, and many institutions are now investing in medical robotic technology for use in general, urological, cardiac, gynaecological, and neurological surgery. When compared to traditional surgical techniques, this innovative and intriguing technology has been found to be safe, have better or equivalent outcomes, and be cost effective [1–3]. A considerable quantity of surgical dissection and accompanying big surgical incisions have been linked to head and neck and numerous airway procedures. Major tissue damage, functional disability, and a lower quality of life can all come from this. Improved video imaging, endoscopic technology, and instrumentation have provided the surgeon with many endoscopic access sites with less invasive techniques. While advancements in endoscopic technology have boosted surgeon skills, the procedure still faces a number of obstacles. Here are several examples: (1) Instrumentation's limited range and degree of motion; (2) operational field limited to "line of sight" (3) amplification of physiologic tremors, (5) reduced dexterity, and (6) mismatched hand-eye coordination due to a lack of three-dimensional imaging of the operating area [5, 6]. With these obstacles in mind, surgical robots was created with the goal of overcoming the limitations of current endoscopic technology and expanding the benefits of MIS. The growing popularity of minimally invasive surgery has influenced how new technology is conceived, developed, and implemented in clinical practise. The field of robotic surgery is progressing and overcoming its limits. It improves outcomes by lowering hospital stays and infection rates while also allowing for better cosmetic results. Surgical robots, on the other hand, were designed to do procedures in large cavities, such as the abdomen, and as a result, the instruments are too large to perform many otolaryngology and head and neck procedures. The da Vinci robot system is beginning to be used to perform a variety of otolaryngology procedures, with outstanding results thus far. Other robotic surgery drawbacks include the robotic system's huge size, which takes more labour to set up and presents new issues for the anaesthetic team and surgical assistants. Unfortunately, the expensive expense of robotic technology prevents it from being used routinely in most operating rooms around the world. This necessitates the creation of smaller, less expensive, and simple-to-operate robotic platforms that are portable and versatile, as well as specialised equipment for head and neck surgery activities. Aside from the evidence of robotic feasibility and safety in head and neck surgery, postoperative airway management and oropharyngeal function outcomes are comparable to or better than traditional surgical techniques. Although we did not look into the specifics of oncologic outcomes, robot-assisted surgery did show a trend toward better cure and recurrence rates. This is due to its capacity to resect tumours in their entirety, a feature made possible by the robotic system's improved dexterity and 3D imaging. Future research comparing robotic procedures to Transoral Laser Microsurgery (TLM), open surgery, and chemoradiotherapy, we feel, will be needed to back up these claims. According to the studies, robotic surgery in head and neck surgeries is feasible and safe, and its usage and exploration should continue.

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