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## **TRANSORAL ROBOTIC THYROID SURGERY: CURRENT INSIGHTS AND FUTURE CHALLENGES**

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Minimally invasive thyroid surgery has gained traction due to the increasing incidence of thyroid diseases and patient demand for aesthetically favorable outcomes. Traditional surgical techniques, primarily the transcervical approach, often result in visible cervical scarring, while alternative methods may involve extensive tissue dissection leading to hidden scars. The advent of transoral endoscopic thyroid surgery (TETS) offers a potential solution, allowing for incision concealment within the oral cavity while maintaining a minimal dissection profile. Nevertheless, TETS implementation presents several technical challenges that could benefit from robotic-assisted systems. This manuscript reviews the current literature on the feasibility and clinical experience associated with transoral robotic thyroid surgery (TORTS).

TORTS is a novel approach, combining the advantages of transoral access with robotic technology, thus enhancing surgical precision and control. The da Vinci surgical system, the only FDA-approved robotic platform applicable to human surgeries, offers high-resolution three-dimensional imaging, wristed instruments, and tremor filtration, facilitating delicate maneuvers while preserving surrounding anatomical structures. The initial feasibility studies conducted on cadaveric and porcine models demonstrated the potential of this technique. Reports from clinical trials indicate variable complication rates, highlighting both the need for optimized instrumentation and careful consideration of the mental nerve's vulnerability during dissection.

Despite the promising results, the slow integration of TORTS into clinical practice is evident, primarily due to high operative times compared to conventional techniques and the associated risk of nerve injuries. Furthermore, reimbursement challenges and the general hesitance in adopting robotic techniques may impede progress. The rarity of reported cases further emphasizes the necessity for extensive trials to validate the safety, efficacy, and cost-effectiveness of TORTS in patients with thyroid disorders. The prospects for this technique hinge on technological advancements and improved surgical methodologies to surmount current limitations, ultimately providing a viable minimally invasive option for thyroid surgery.