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British Journal of Oral and Maxillofacial Surgery xxx (2017) xxx–xxx

BRITISH  
Journal of  
Oral and  
Maxillofacial  
Surgery[www.bjoms.com](http://www.bjoms.com)

# Robot-assisted excision of the submandibular gland by a postauricular facelift approach: comparison with the conventional transcervical approach

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Accepted 26 October 2017

## Abstract

Various approaches have been described for excision of a submandibular gland including endoscopic and robot-assisted techniques. We present the outcome of excision by a robot-assisted postauricular facelift approach and compare it with the conventional transcervical approach. We studied 30 cases of excision of the gland for benign disease (16 transcervical and 14 robot-assisted), and collected clinical and personal data, and details of patients' satisfaction with the result. The most common conditions were sialadenitis (n = 15) and pleomorphic adenoma (n = 12). The robot-assisted operations took significantly longer (p = 0.045), had more drainage (p < 0.001), and a significantly better cosmetic outcome (p = 0.002). Robot-assisted excision of the submandibular gland may prove to be a viable option in the treatment of benign conditions for those patients seeking a better cosmetic outcome.

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**Keywords:** Submandibular gland excision; Robot-assisted surgery; Postauricular facelift approach; Outcome; Cosmesis

## Introduction

The excision of a submandibular gland is indicated for a number of conditions such as recurrent sialadenitis, sialolithiasis, neoplasm, and rarely, sialorrhoea.<sup>1</sup> The conventional transcervical incision (mostly using a natural skin crease) remains the most common approach, because it gives easy direct access to the gland, but has the inevitable consequence of a visible scar. To achieve a better cosmetic outcome and potential benefits such as shorter hospital stay, reduced

blood loss, and lower morbidity, there has been a move towards minimally-invasive techniques in all surgical specialties. Head and neck surgery is no exception, and there have been increasing reports of minimally invasive surgery or remote access techniques used for various conditions. The excision of a submandibular gland is one that has been the target of endoscopic and robot-assisted procedures.

Published descriptions of robot-assisted excision of the gland have been restricted to small case series,<sup>2–6</sup> and to the best of our knowledge there are currently no studies that have directly compared the outcome of robot-assisted excision of the submandibular gland with that after the transcervical approach. The aim of this study was therefore to compare the outcome of robot-assisted excision by the postauricu-

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<https://doi.org/10.1016/j.bjoms.2017.10.013>

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lar facelift approach with that of the conventional excision through the transcervical approach.

## Methods

We studied 30 patients who had submandibular glands excised for benign conditions at the Hanyang University Hospital, Seoul, South Korea, during the period 2013–2016. Of the 30 patients, 14 had robot-assisted operations using the da Vinci<sup>®</sup> Surgery robot system (Intuitive Surgical Inc, Sunnyvale, CA, USA) and 16 had conventional transcervical excision. All operations for malignant disease, and those treated with endoscopically-assisted surgery, were excluded. Patients with a history of neck surgery or irradiation were also excluded. Patients were not randomised, as the choice of approach was governed by the patient's response after the options had been put to them. Financial considerations influenced the choice in some cases, because robot-assisted surgery is not covered by public medical insurance in South Korea. The patients in the robotic group were informed about the procedure and the possibility of conversion to a conventional transcervical approach, and written informed consent was obtained from all patients.

Data were collected prospectively on personal and clinical details, histopathological diagnosis, operating time, output from the drain, perioperative complications, and cosmesis. Comparisons of outcome were made between those who had robot-assisted surgery and those who had the conventional transcervical approach. Postoperative cosmetic satisfaction was measured using a questionnaire that was given to each patient that contained two questions about the scar on the neck and the contour of the neck:<sup>7</sup> “How satisfied are you with your neck scar or scarless neck?” and “How satisfied are you with the contour of your neck?” The cosmetic satisfaction score was defined as the sum of the score of the two questions using a verbal response scale from 1 (very satisfied), 2 (satisfied), 3 (average), 4 (dissatisfied), to 5 (very dissatisfied).

All robotic operations were done by the senior author (KT) with assistance from trainee surgeons for raising the skin flap and closing the wound. A postauricular skin-crease incision that extended along the hairline of the scalp was used to raise a subplatysmal skin flap towards the submandibular space under direct vision (Fig. 1). The great auricular nerve and the external jugular vein were identified and preserved. Once the skin flap had been raised as far as the submandibular space (Fig. 2), the external retractor (L&C Bio, Seoul, Korea) was inserted to maintain a working space. Though this access may allow some direct dissection of the tissue on the lateral aspect, it does not allow safe dissection of the deeper tissue (particularly on the medial and superior aspect where the robotic assistance was required).

A 30° endoscope with two robotic arms, including Maryland forceps on the left and Harmonic<sup>®</sup> curved shears on the right, was inserted face-downwards through the postauricu-



Fig. 1. A postauricular facelift incision in the postauricular sulcus and continued along the hairline.

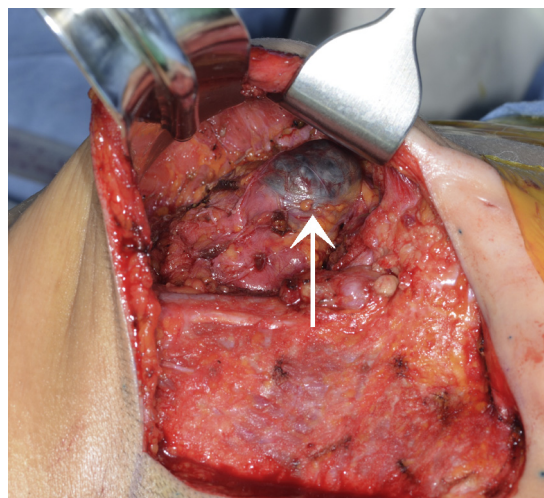


Fig. 2. The subplatysmal skin flap raised towards the submandibular space. The arrow indicates a pleomorphic adenoma of the submandibular gland.

lar incision. The gland was dissected in a subcapsular fashion taking care to avoid injury to the marginal mandibular nerve as in the conventional approach (Fig. 3A). The proximal portion of the facial artery was divided using Harmonic<sup>®</sup> curved shears or an endoscopic haemoclip. After retraction of the mylohyoid muscle, the lingual nerve and its tributary to the submandibular gland were identified and divided (Fig. 3B). Wharton's duct and the accompanying blood vessels were divided using Harmonic<sup>®</sup> curved shears or a haemoclip. After the gland had been resected completely, a negative suction drainage was inserted, and the wound closed in layers.

The transcervical approach included an incision about 5 cm along a natural skin crease at a level at least two fingerbreadths from the inferior mandibular margin, followed by conventional subcapsular dissection of the gland using a standard scalpel with monopolar and bipolar diathermy.

Continuous variables were compared using the Mann–Whitney *U* test, and categorical variables using Fisher's exact test. All statistical analyses were made with

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