



Original research

# The perception of scar cosmesis following thyroid and parathyroid surgery: A prospective cohort study



Asit Arora<sup>a, \*</sup>, Chloe Swords<sup>a</sup>, George Garas<sup>a</sup>, Konstantinos Chaidas<sup>a</sup>, Alexa Prichard<sup>a</sup>, James Budge<sup>a</sup>, D. Ceri Davies<sup>b</sup>, Neil Tolley<sup>a</sup>

<sup>a</sup> Department of Otorhinolaryngology and Head & Neck Surgery, St. Mary's Hospital, Imperial College Healthcare NHS Trust, London, W2 1NY, UK

<sup>b</sup> Human Anatomy Unit, Department of Surgery and Cancer, Imperial College London, W6 8RP, UK

## HIGHLIGHTS

- Scar-related issues are not uncommon following thyroid and parathyroid surgery.
- No correlation was found between scar length and patient satisfaction.
- The perception of an acceptable cosmetic result differs between patient and clinician.
- Asian and Afro-Caribbean ethnicity and a malignant diagnosis were associated with a poor cosmetic outcome.
- The majority of patients would choose to avoid a neck scar given the option.

## ARTICLE INFO

### Article history:

Received 6 July 2015

Received in revised form

24 October 2015

Accepted 15 November 2015

Available online 19 November 2015

### Keywords:

Scar cosmesis

Robotic

Thyroidectomy

Parathyroidectomy

Quality of life

## ABSTRACT

**Introduction:** Various “scarless” approaches have been described for thyroid and parathyroid surgery. The objective of the current study was to investigate patients' perception of neck scar cosmesis, its impact on quality of life (QoL) and evaluate patient preference with regards to scar location.

**Methods:** 120 patients undergoing thyroid or parathyroid surgery were followed-up over a 5-year period (2008–2013). Validated tools were used to assess scar perception and its impact on QoL. These were evaluated against sex, age, ethnicity, operation type, histopathology, time following surgery and scar length.

**Results:** Mean follow-up was  $2.6 \pm 3.8$  years. One of the most common post-operative problems was scar-related ( $n = 18$ ). Caucasian patients and those with benign histology expressed a lower impact on QoL ( $p < 0.001$ ,  $p = 0.038$ ). Sex and scar length did not significantly affect patients' perception for scar cosmesis ( $p > 0.05$ ). Clinicians tended to score scar cosmesis higher than patients ( $p = 0.02$ ). Most participants (75%) expressed a clear preference for an extracervical “scar-less in the neck” approach.

**Discussion:** Scar-related issues are frequently reported following thyroid and parathyroid surgery. The negative impact, often underestimated by clinicians, is more apparent amongst Asian and Afro-Caribbean patients and can significantly impact on their QoL. This, combined with the lack of correlation between scar length and patient satisfaction, indicates the need to divert research from miniaturising neck scars to concealing them in extracervical sites.

**Conclusion:** Patients prefer a scar-less in the neck approach when given the option. A prospective comparative study is required to compare the cervical and extracervical approaches.

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## 1. Introduction

The standard approach to thyroidectomy uses an anterior neck incision known as “Kocher incision” that is usually 6–8 cm long [1]. In experienced hands, this approach leads to high success rates and low morbidity. However, thyroid surgery is continuously evolving in response to a number of concerns [1,2]. A particular concern with

\* Corresponding author. Department of Otorhinolaryngology and Head & Neck Surgery, St Mary's Hospital, Imperial College Healthcare NHS Trust, Praed Street, London, W2 1NY, UK.

E-mail address: [asitarora@doctors.org.uk](mailto:asitarora@doctors.org.uk) (A. Arora).

the Kocher incision is the possibility of scarring in the exposed anterior neck. Although in the majority of patients the incision heals well, a proportion of patients are left with a noticeable, aesthetically unattractive and psychologically distressing scar [3]. Individual patient characteristics such as age, race and sex can influence scar characteristics and its associated cosmetic perception. As a result, a multitude of surgical techniques have been described in an attempt to reduce the scar-related morbidity associated with thyroid surgery [4].

Minimally invasive video-assisted thyroidectomy (MIVAT) developed by Miccoli [5] is currently the most widely used minimal access technique. Despite MIVAT utilising a smaller incision, a visible neck scar remains. Extracervical endoscopic techniques for thyroid surgery were developed to address this exact problem. Although the literature supports “scarless” (in the neck) endoscopic thyroidectomy (SET) over conventional thyroidectomy in terms of its perceived aesthetic outcome [1,2], SET techniques have significant limitations due to the 2-dimensional view obtained and rigid instrumentation involved. Those ergonomic limitations have hindered the widespread adoption of SET.

SET was re-popularised in 2009, when a group from South Korea led by Chung pioneered the technique of robotic axillary thyroidectomy (RAT) using the da Vinci<sup>®</sup> robot (Intuitive Surgical, Inc, Sunnyvale, CA) [6,7]. Robotic instrumentation offers numerous advantages over both conventional and endoscopic thyroidectomy [8,9]. In addition to a “scarless” approach, the robotic system offers a superior 3-dimensional view associated with increased precision, tremor filtration, and greater articulation [10]. Despite these advantages, RAT also has some important disadvantages compared to conventional thyroidectomy approaches. Far from being minimally invasive, the robotic transaxillary approach to the thyroid gland involves additional dissection and an associated potential risk to neurovascular structures.

Despite extensive research into novel, “scarless” techniques, little is known about scar perception following conventional thyroid and parathyroid surgery. Moreover, the relationship between patients' and healthcare professionals' impression of scars is poorly understood. Consequently, before offering a RAT approach, it is fundamental to understand and consider the patients' perceptions and attitudes.

The objectives of this study were threefold: (1) to investigate patients' scar perception following conventional thyroid and parathyroid surgery in a UK population; (2) explore patients' attitudes towards “scar-less in the neck” surgery and (3) compare clinician to patient perception for the same scars. Particular attention was paid to the effects of sex, age and ethnicity on patients' perceptions and to the impact of scars on patients' quality of life (QoL).

## 2. Methods

Patients who underwent conventional thyroid or parathyroid surgery at St. Mary's Hospital, London, UK were surveyed over a 5-year period (December 2008–January 2013). A total of 120 patients consented to be evaluated. This was a prospective study that evaluated outcome measures as part of routine post-operative follow-up. Patients younger than 16 years of age, those with a history of radiotherapy to the head and neck and those who had also undergone lateral compartment neck dissection were excluded from the study.

With regards to cervical incision planning, this was based on whether an obvious skin crease was present on the patient's neck and the size of the thyroid nodule or parathyroid adenoma to be excised. Incision length was kept to a minimum (usually about 4 cm) though long enough to allow delivery of the lesion. The

incision was always planned to be symmetrical with respect to the midline so as not to “catch the eye”.

If an obvious skin crease was present, then this was opted for. If not, a suture was used to mark the incision which was commonly located around the cricoid area. A high incision is generally preferred for 3 reasons: (1) we believe it is cosmetically superior; (2) it improves access to the superior poles, the most challenging area to dissect during thyroid surgery and (3) in the event that the histopathological examination result of the excised specimen comes back as malignant and a neck dissection is required at a later stage, a high incision can be easily extended along the relaxed skin tension lines. In contrast, a low incision will necessitate superior diversion causing it to transgress the relaxed skin tension lines (i.e. extend across rather than along them) thus compromising wound healing in addition to being longer, wider and curved.

Wound closure was standardised for all patients comprising of 3-layer closure with interrupted 4-0 Vicryl sutures for the strap and platysma muscles followed by continuous 5-0 Vicryl Rapide subcuticular sutures. Following skin closure, Dermabond (Ethicon Endo-Surgery, Inc) tissue glue was applied on the wound. No drains were used. Post-operative wound management was identical throughout the cohort (standard wound care, no antibiotic ointment used routinely).

To quantify scar perception, a visual analogue scale (VAS) was used. This has been validated for the assessment of linear post-operative scars [11]. It can reliably discriminate between different types of scar quality and accurately evaluate patient satisfaction regarding scar cosmesis. Three sets of data were collected.

### 2.1. Demographic data

Details including age, sex and ethnicity were recorded (Appendix A). Other information included time elapsed since surgery and operation type. Post-operative complications, including hypertrophic and keloid scar formation, were recorded in free text. Histopathology data was collected using electronic medical records. The records were incomplete for 15 patients.

### 2.2. Patient self-assessment

Patients were asked to assess their scar as it appeared at particular time intervals following surgery (Appendix B). A VAS was used, where 0 indicated the poorest scar (completely unsatisfied) and 10, a “perfect” scar (completely satisfied). Patients were also asked to quantify the effect of the scar on their QoL using a VAS (where 0 indicated no effect and 10, a major effect). Patients were also given the opportunity to make free text comments. In addition, patients' attitudes to scar location (cervical or extracervical) were evaluated using the following question: “if all else were equal between surgical sites (i.e. recovery time, complications, etc.), which site, as indicated by the diagram, would you opt for?” The patients were subsequently given a pictorial representation of 4 anatomical scar sites; upper neck, lower neck, infraclavicular area and axilla, and asked to rank the 4 sites from 1 (most preferred) to 4 (least preferred) (see Appendix C).

### 2.3. Independent observer assessment

This involved a subjective blind evaluation of a patient's scar by 3 independent assessors: an ENT – Head & Neck surgeon, an endocrinologist and a medical student. The same VAS tool used for patient self-assessment was employed (Appendix D). This was performed on 44 patients, when all 3 evaluators were available in the clinic to assess the scar.

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