

# Cricothyroid approximation: How I do it

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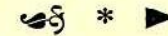
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# Transsexuals are distinct from crossdressers and transvestites

- Strong and persistent cross-gender identification
- Persistent discomfort with their assigned natal sex and its associated gender role
- 1 in 12,000 incidence
- Distress with a high suicide rate

## The TRANSSEXUAL PHENOMENON



Harry Benjamin, M.D.

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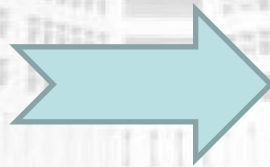


**Candy & Andy**

# Sex Reassignment is effective in addressing gender dysphoria

## Hormonal treatment

Oestradiol Valerate  
Ethinylestradiol  
Medroxyprogesterone  
Acetate  
Dydrogesterone  
Cyproterone Acetate  
Flutamide  
Nafarelin Acetate  
Goserelin Acetate



## Surgery

Bilateral orchidectomy  
Penectomy  
Clitoroplasty  
Penile Inversion  
Vaginoplasty  
Colovaginoplasty  
Augmentation  
mammoplasty  
Facial feminization surgery  
Voice surgery



# Many transsexuals have successfully completed sex reassignment...



# A masculine voice is an embarrassment

- Masculinity in voice is determined by pitch, resonance and timbre
- Speech therapy focussing on a falsetto speech and female intonation is of limited success – particularly in involuntary speech
- Oral and parenteral oestrogens have no effect on vocal folds or laryngeal framework in adulthood
- Resonance and timbre is largely determined by length of the upper airway – is difficult to alter
- Fundamental speech frequency ( $F_0$ ) of 155 – 160 Hz is critical for feminine perception – can be achieved



# Surgery can alter pitch elevation

$$F_0 = (1/2L) \times \sqrt{(T/P)}$$

L = Length

T = Mean longitudinal stress

P = Tissue density

- Wendler's Glottoplasty / Anterior web creation
- Cricothyroid approximation
- Laser-assisted voice adjustment (LAVA)
- Laser resection of thyroarytenoid (Abitbol)
- Anterior cord reduction and advancement (Kunachak)

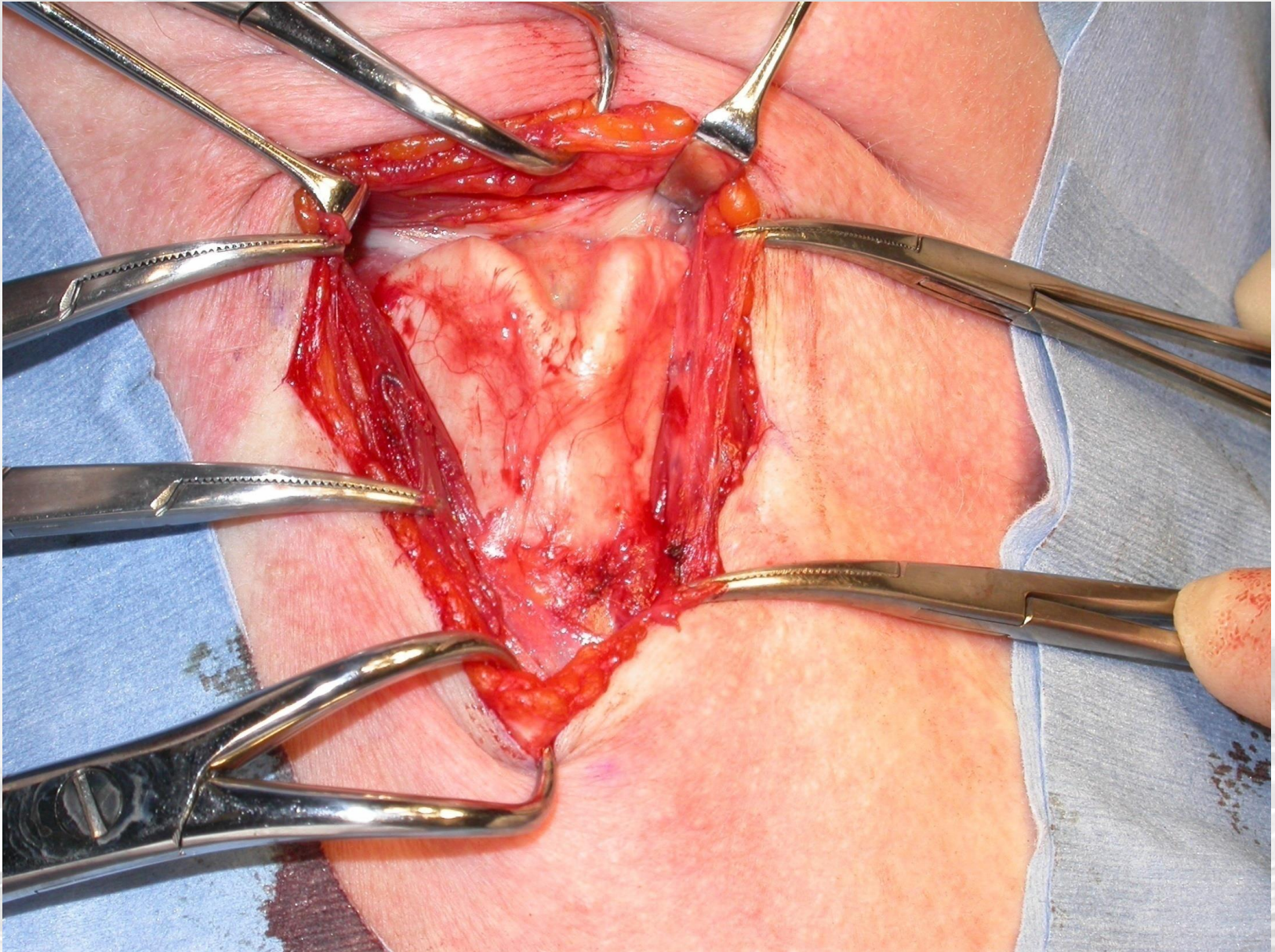


# CTA is the most popular approach

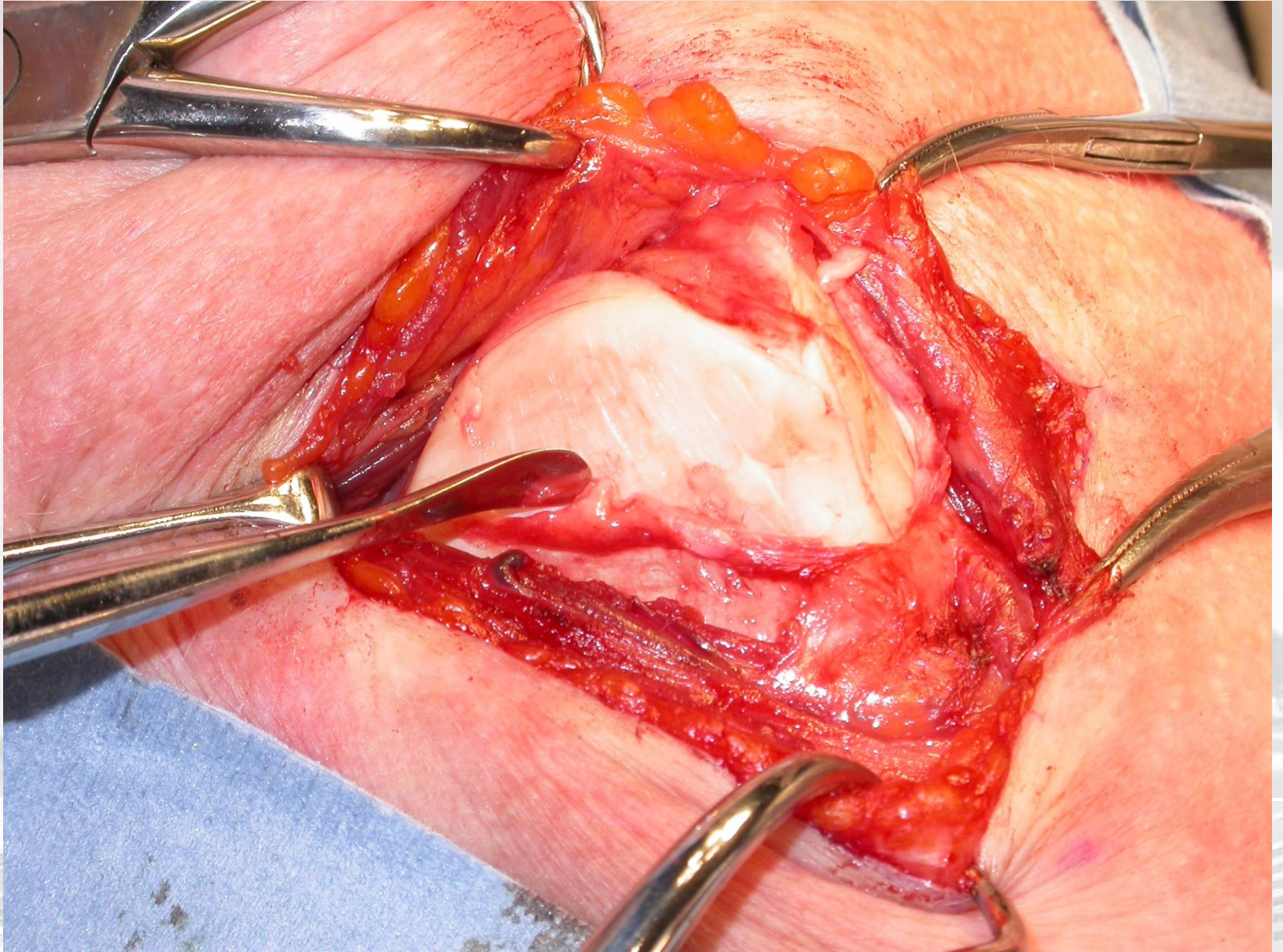
- Procedure first described by Isshiki in 1974
- It is physiological and reversible
- Cricothyroid approximation increases vocal fold tension. Pickuth estimated an 18 Hz rise for every 1 mm of approximation
- Isshiki's series of 11 in 1983 only included 1 male-to-female transsexual. Most were women with androphonia
- Initial studies show variable results with success rates of between 38% (Neumann, 2002) and 85% (Wagner, 2003)
- The procedure allows for laryngeal chondroplasty to reduce the prominence of the thyroid (Adam's apple)



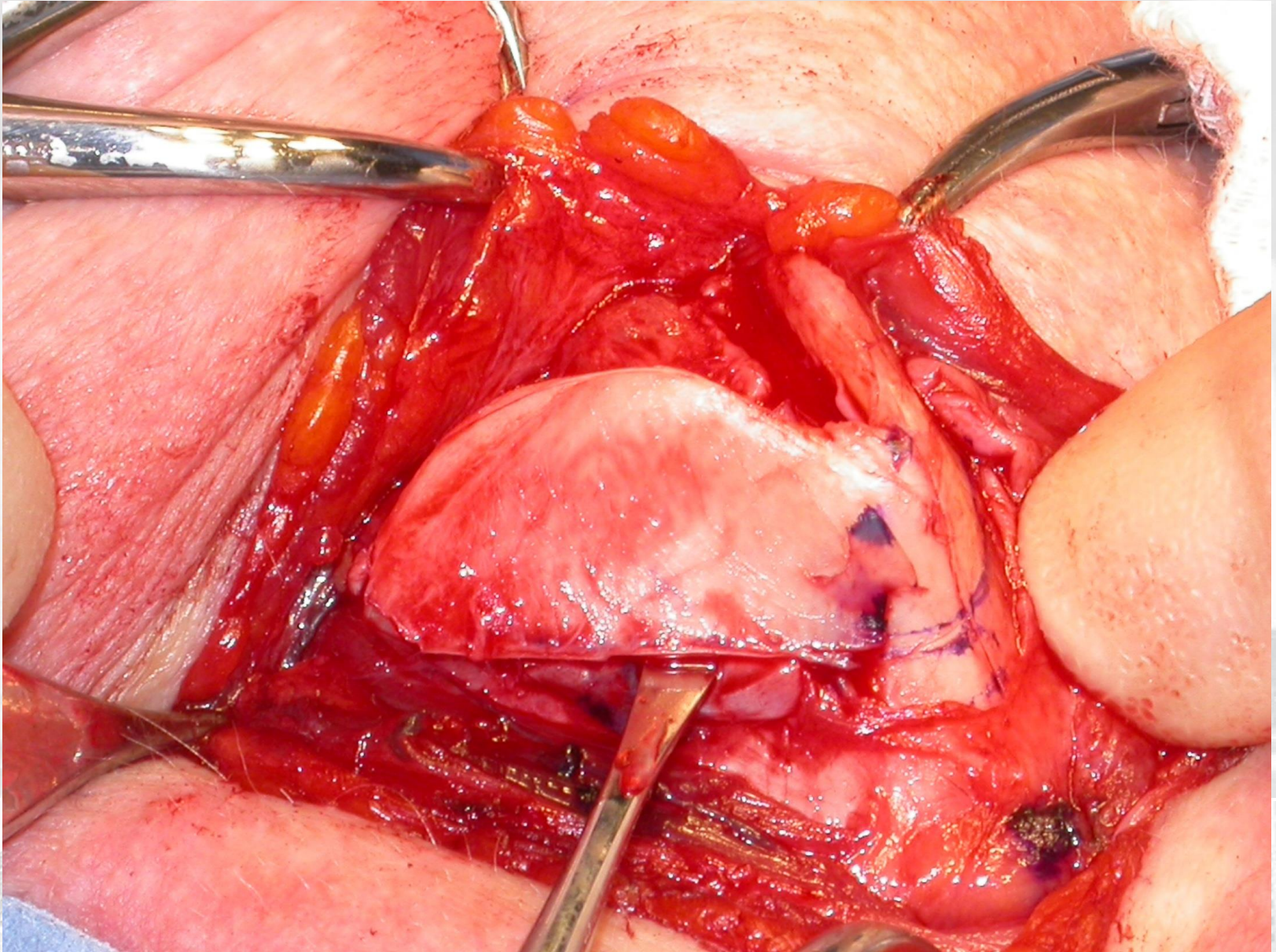




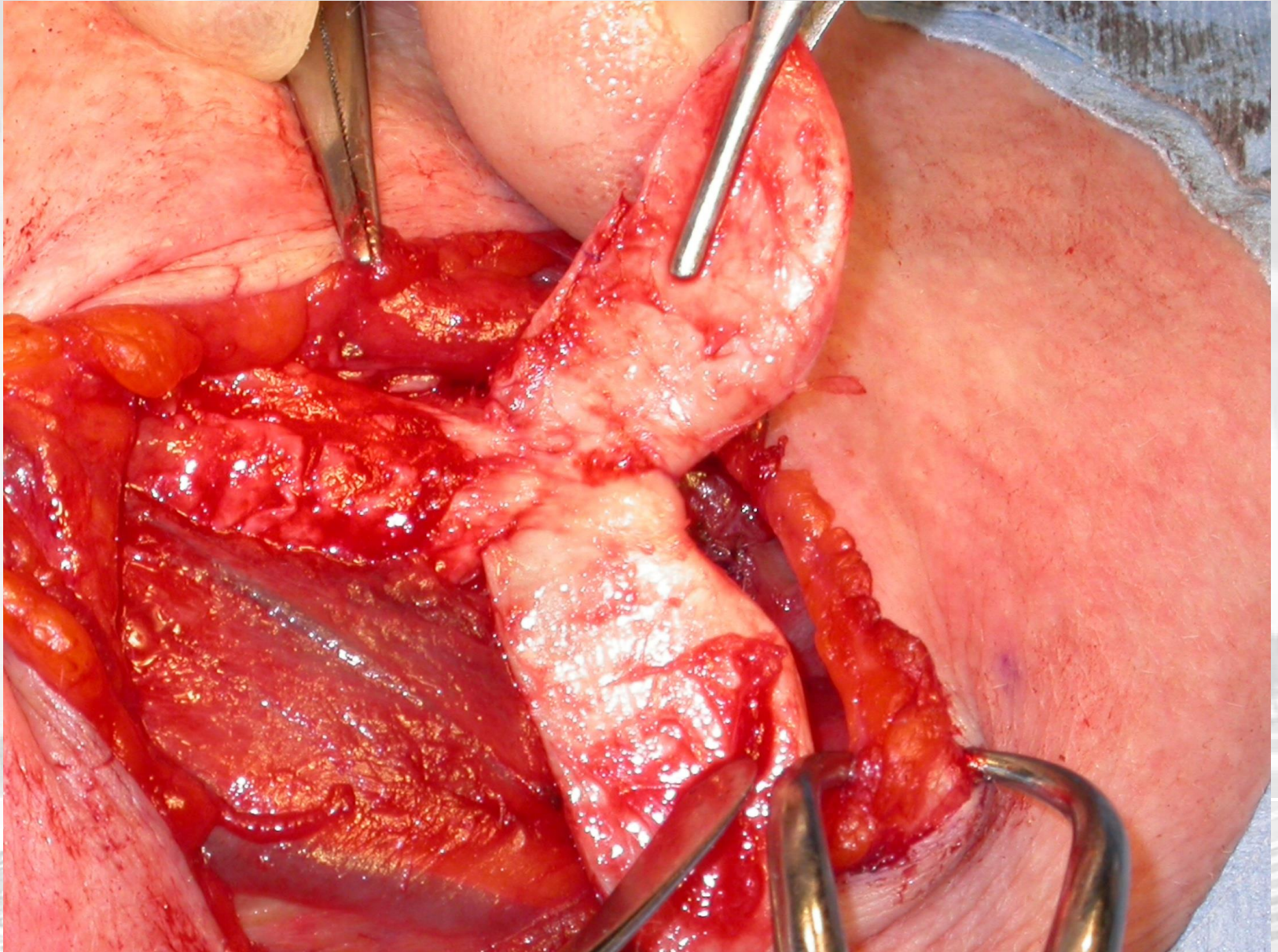








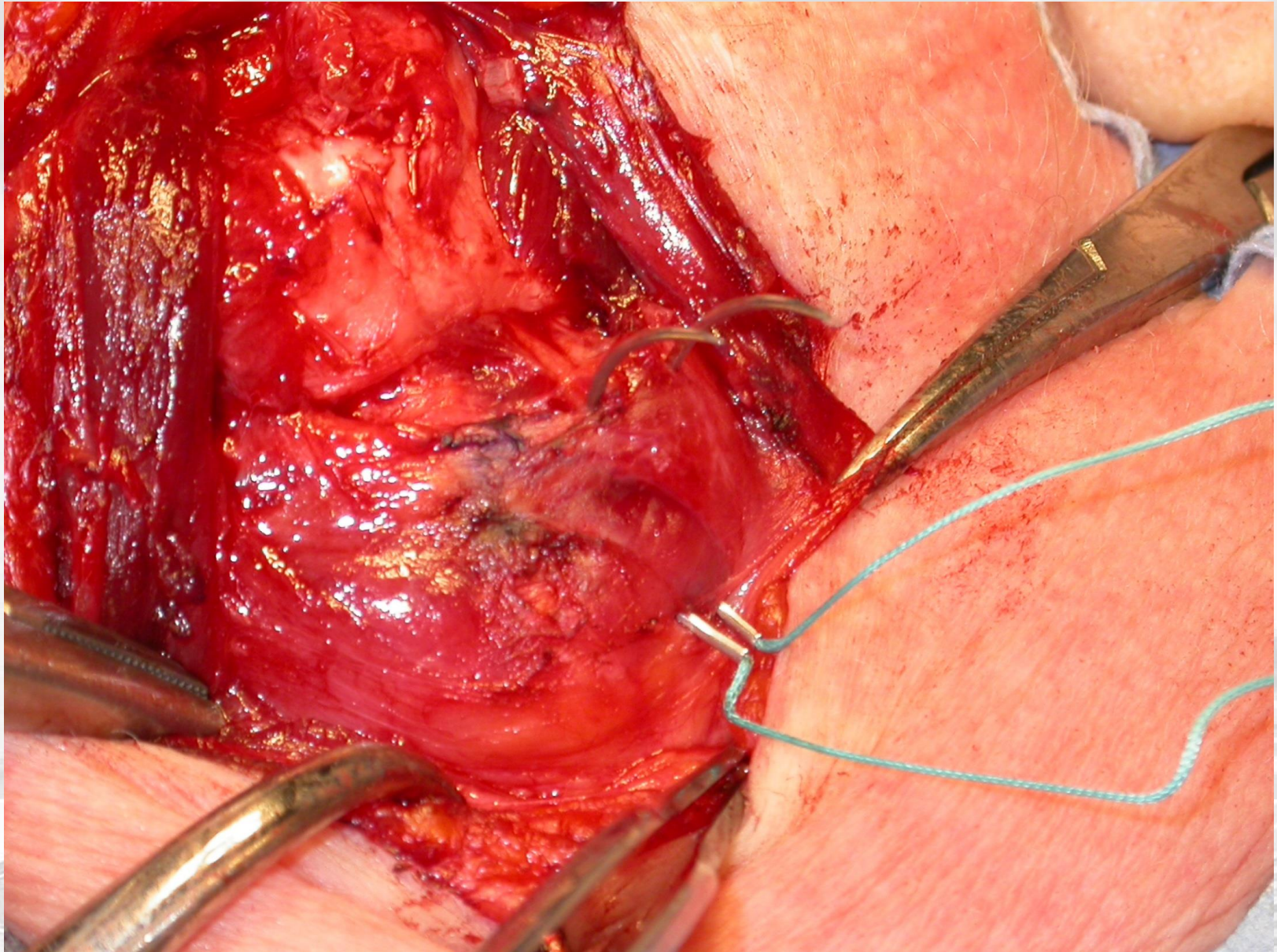




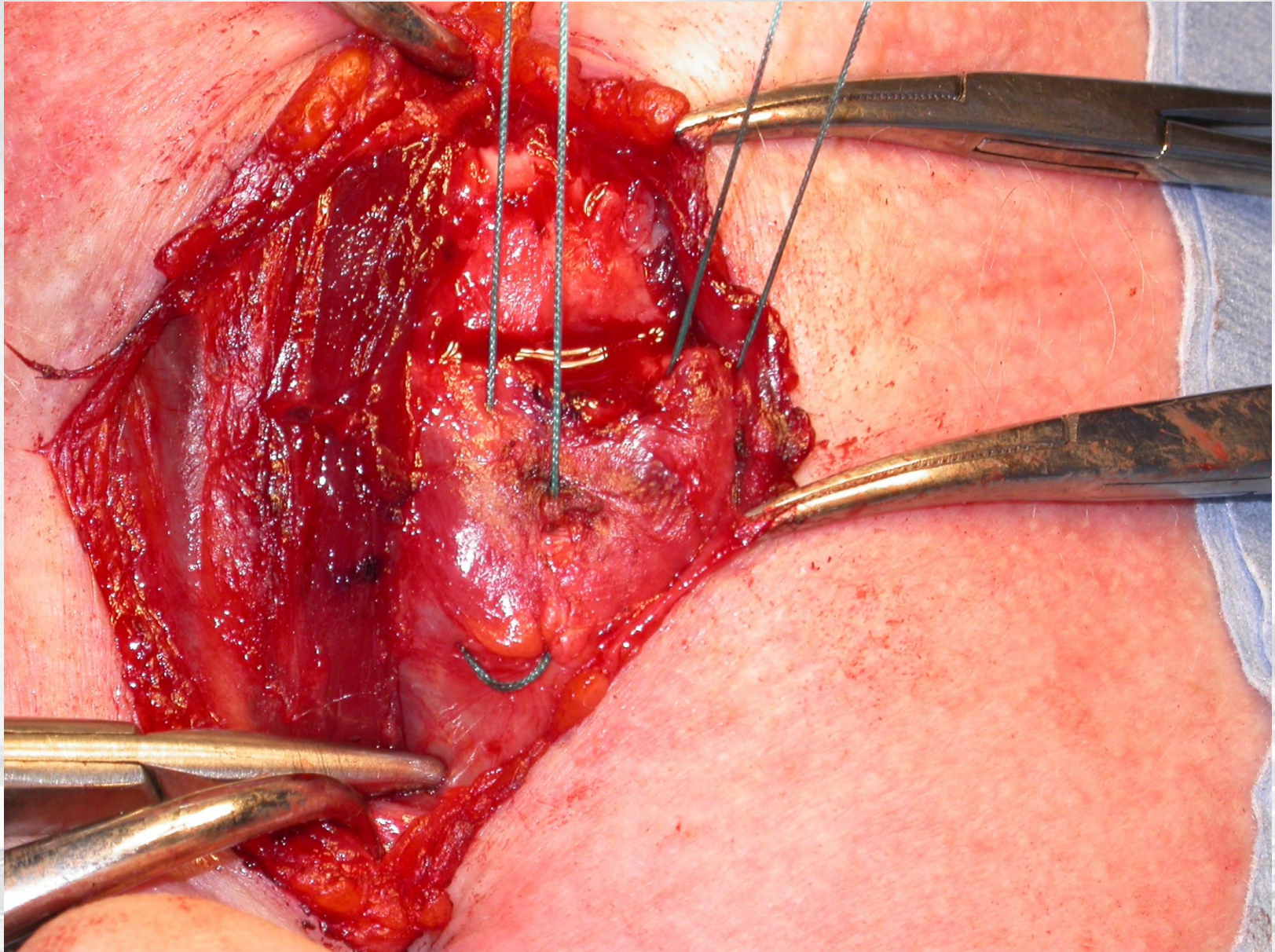




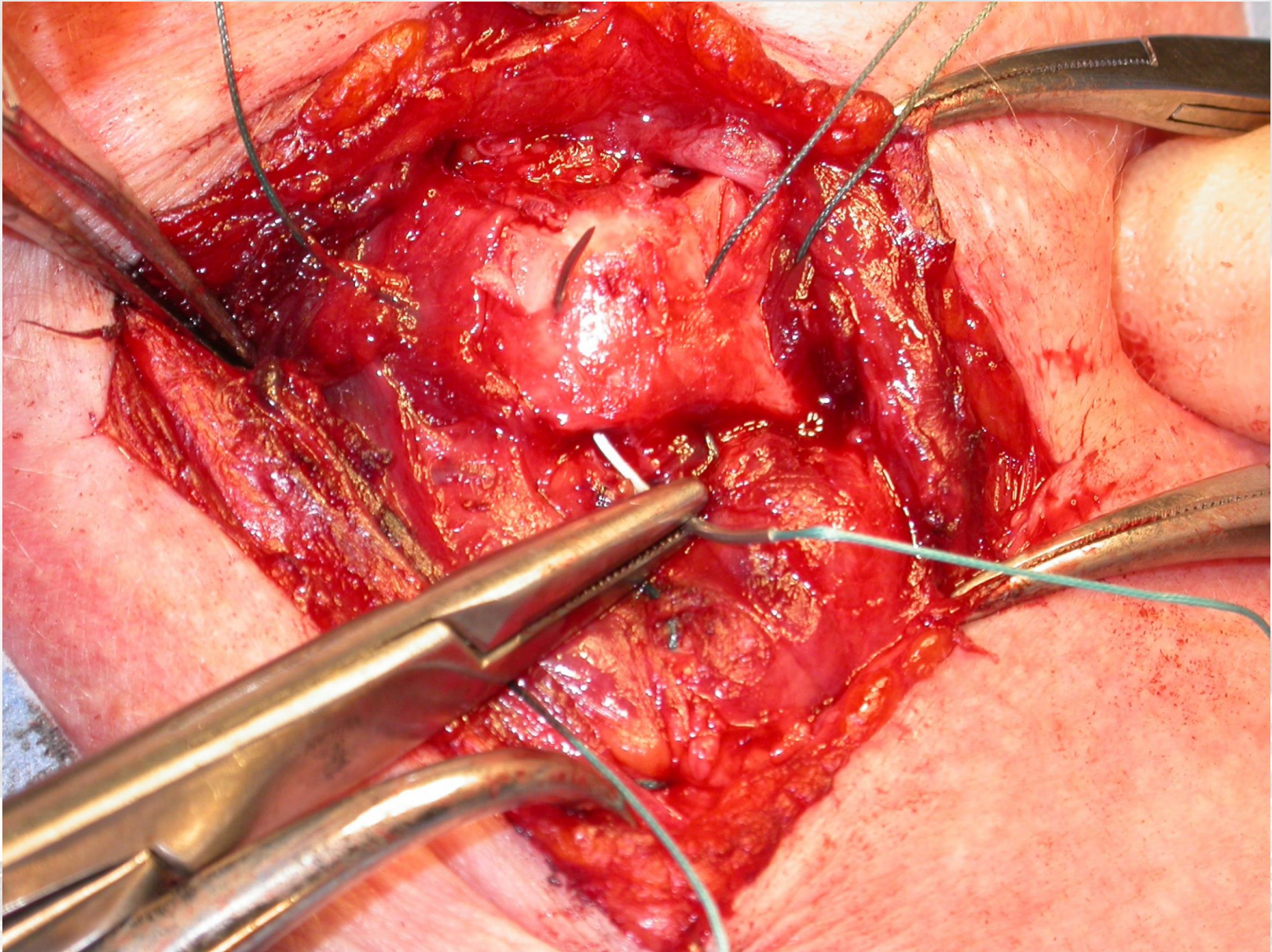




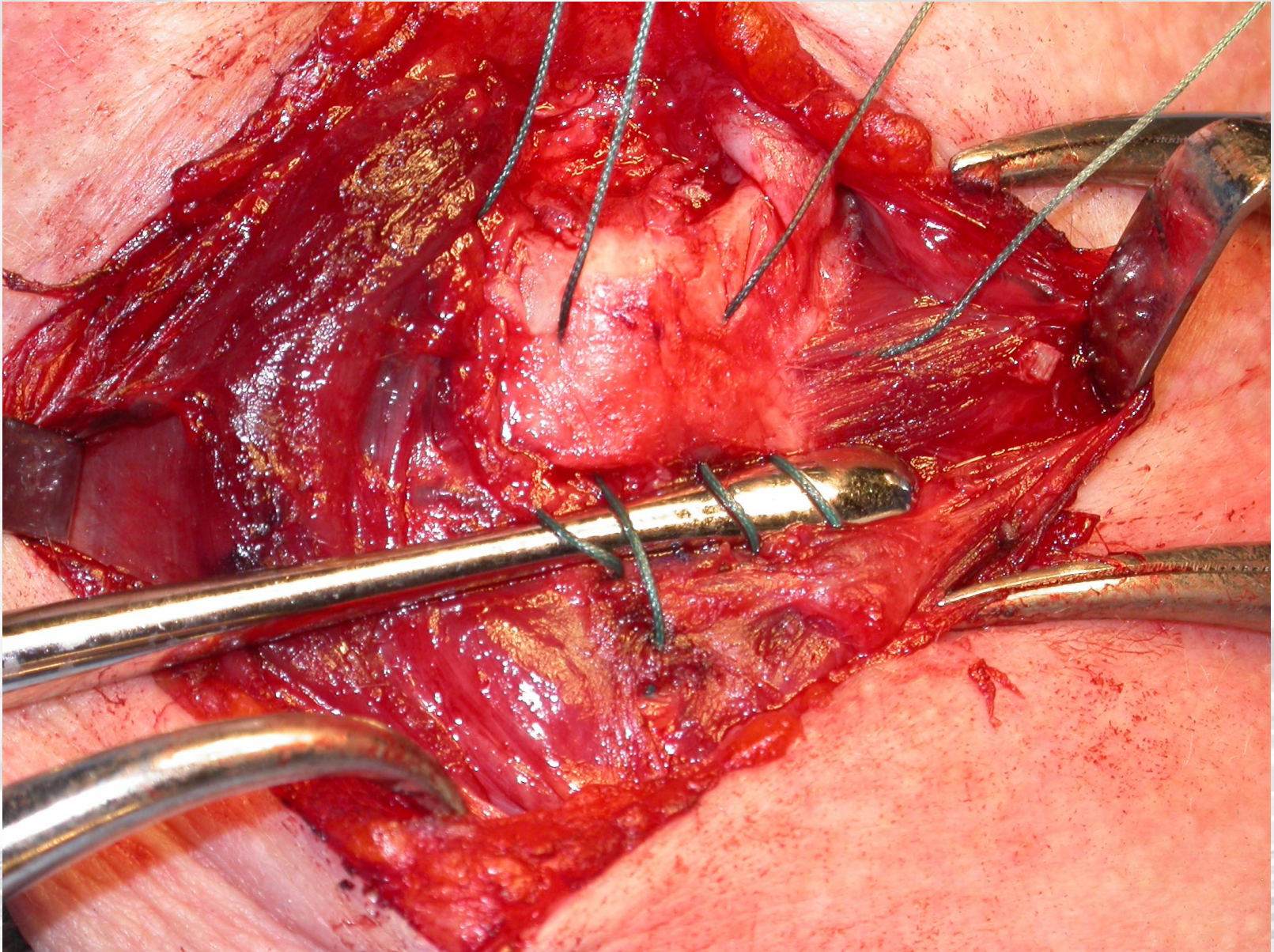




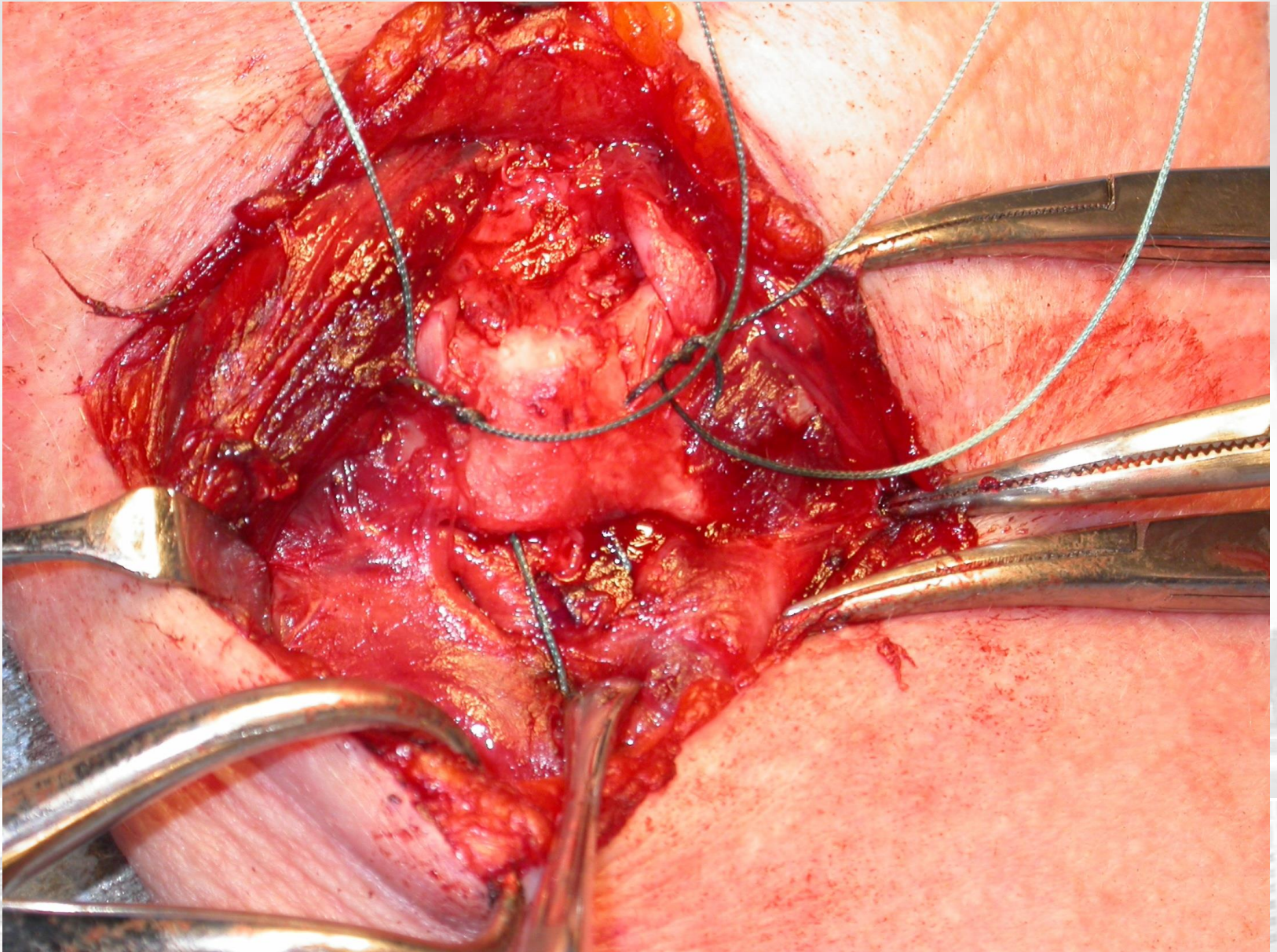




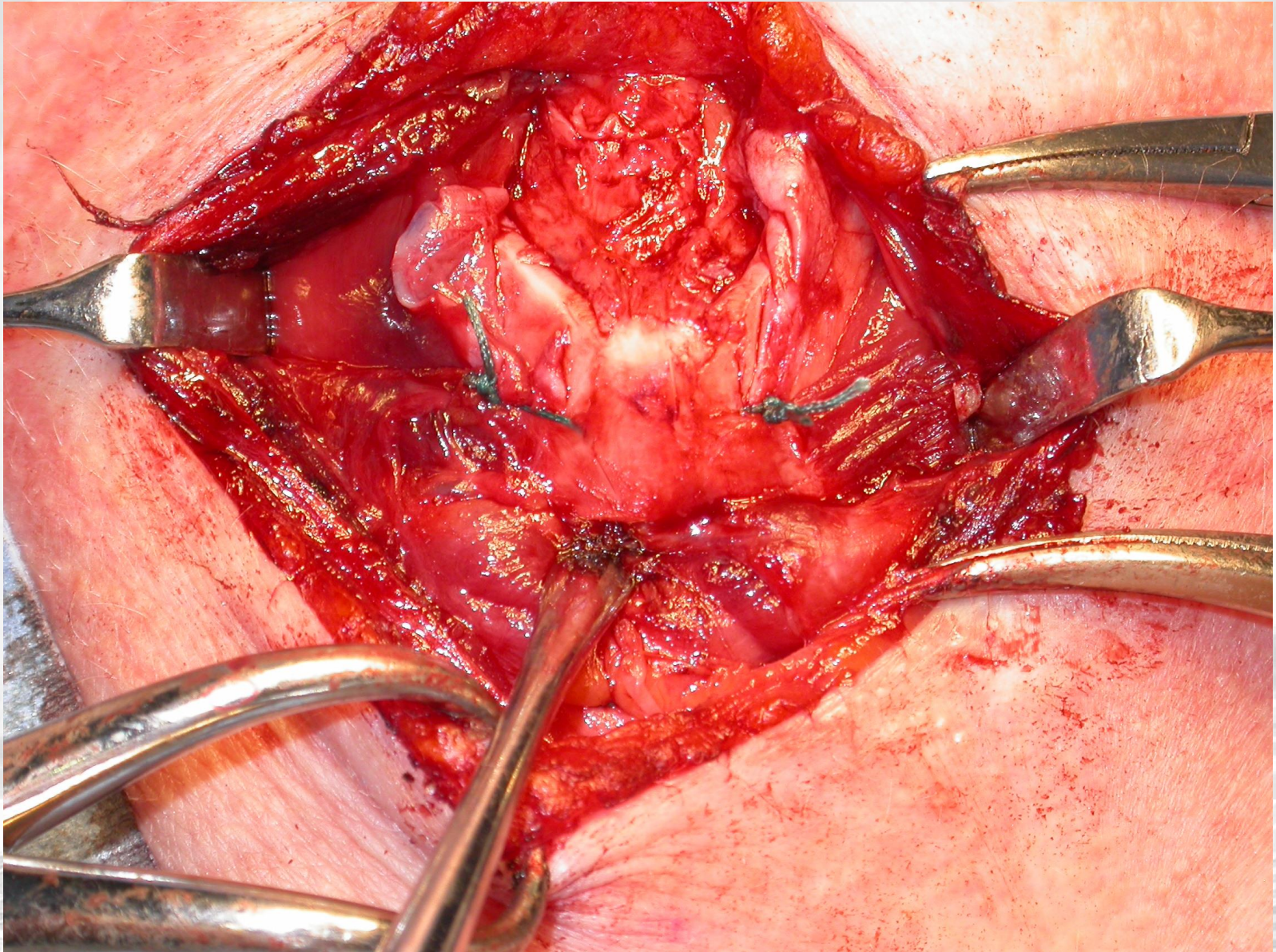


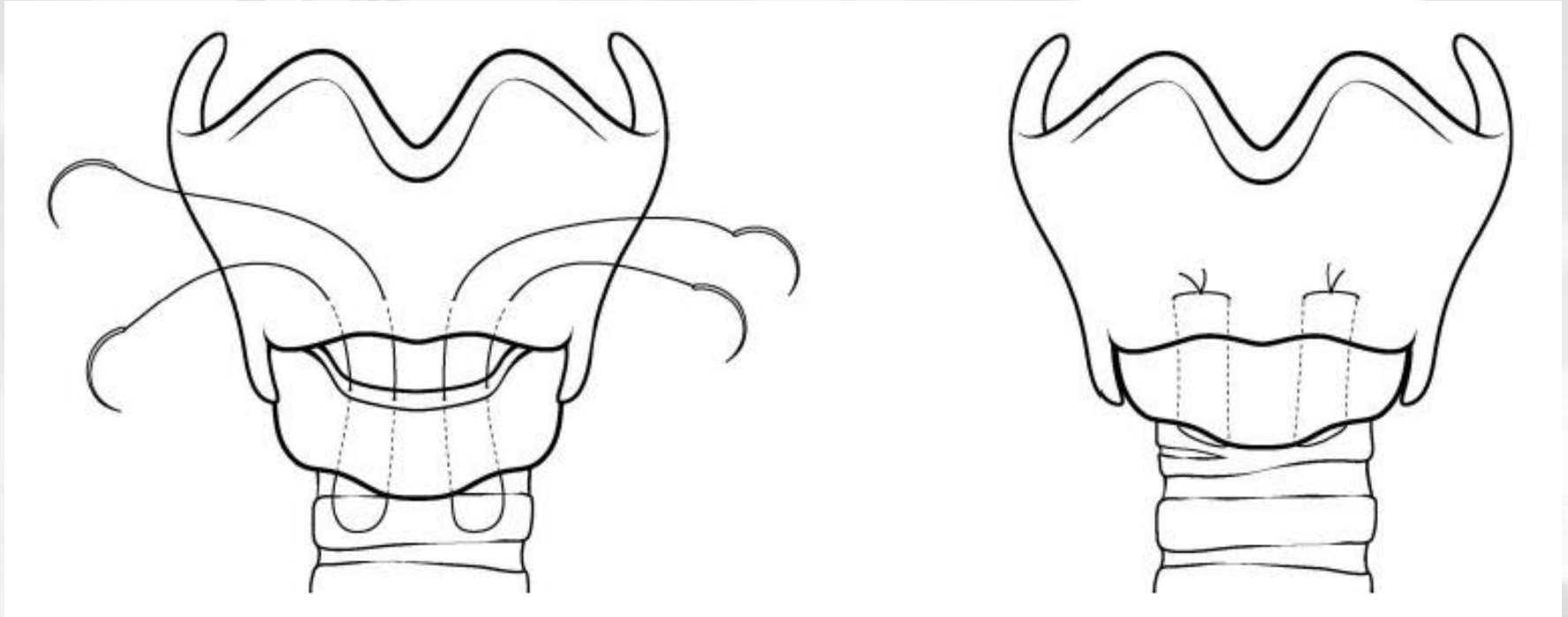




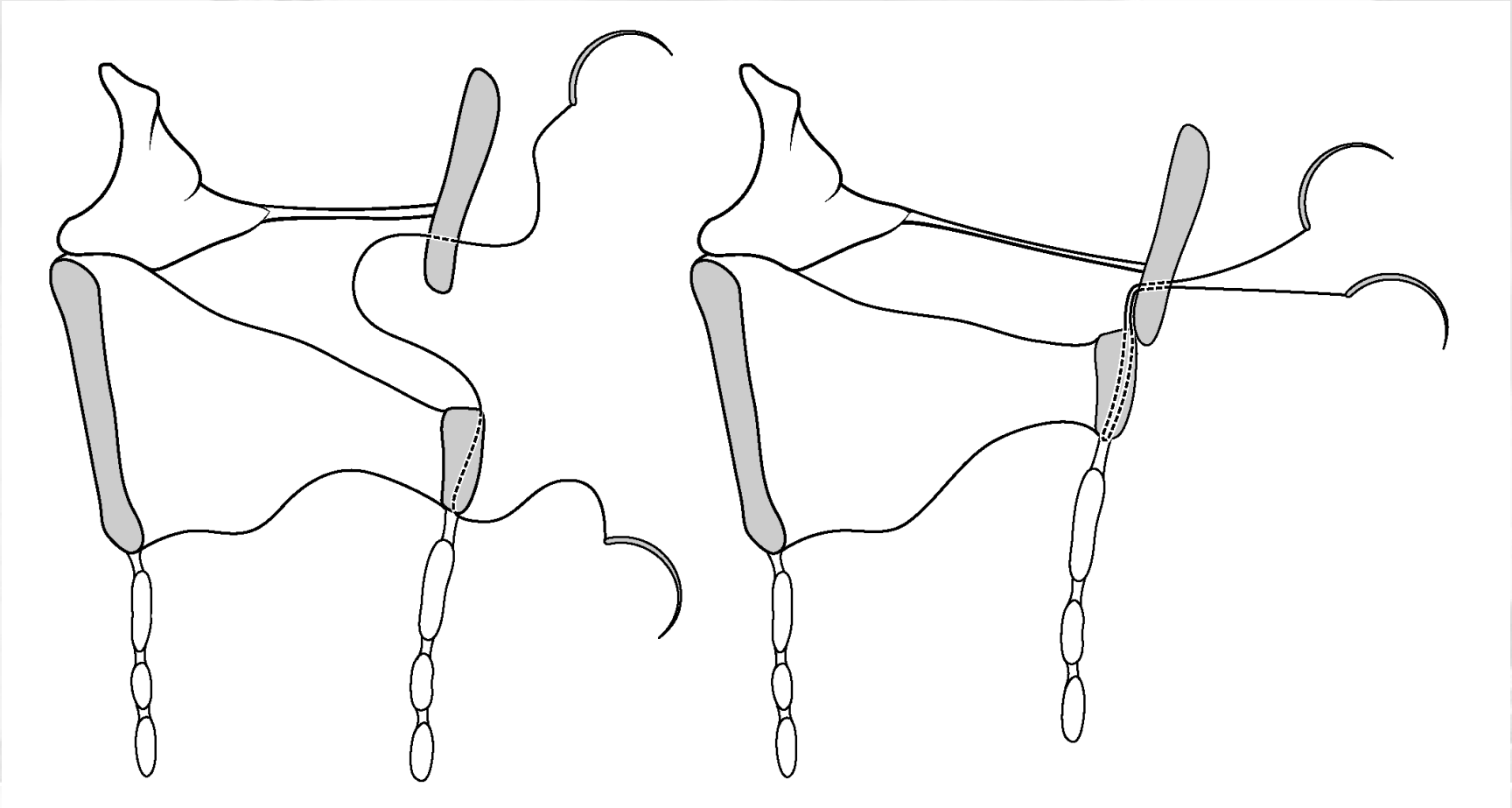










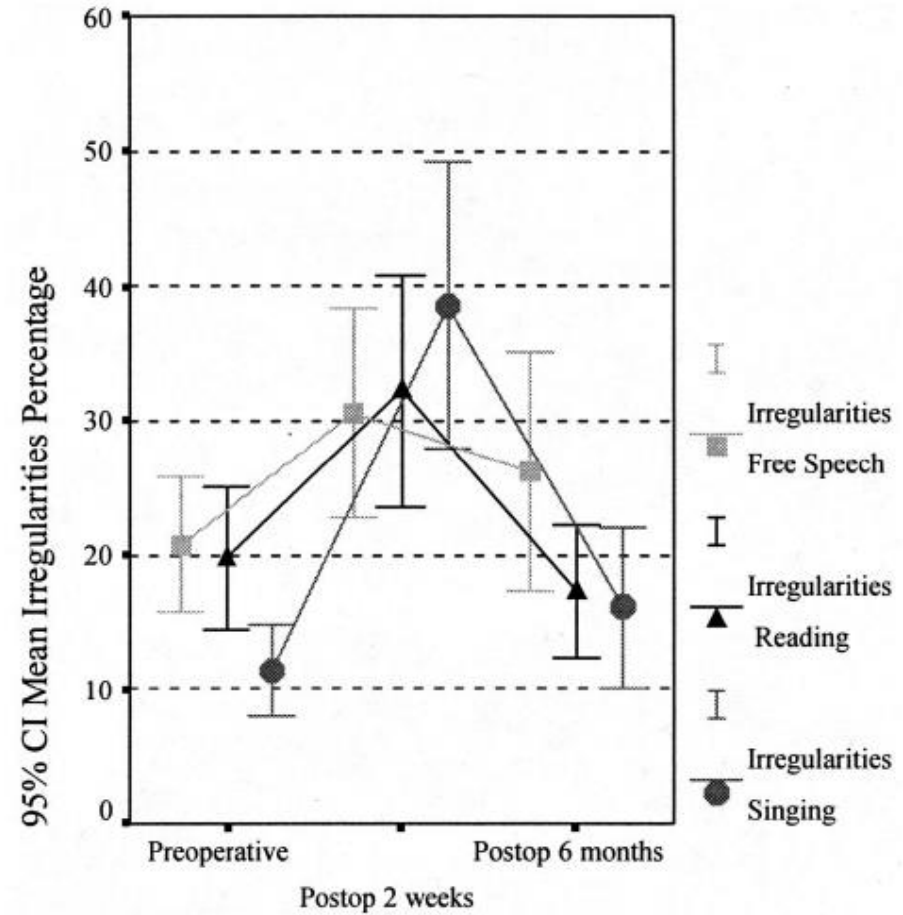
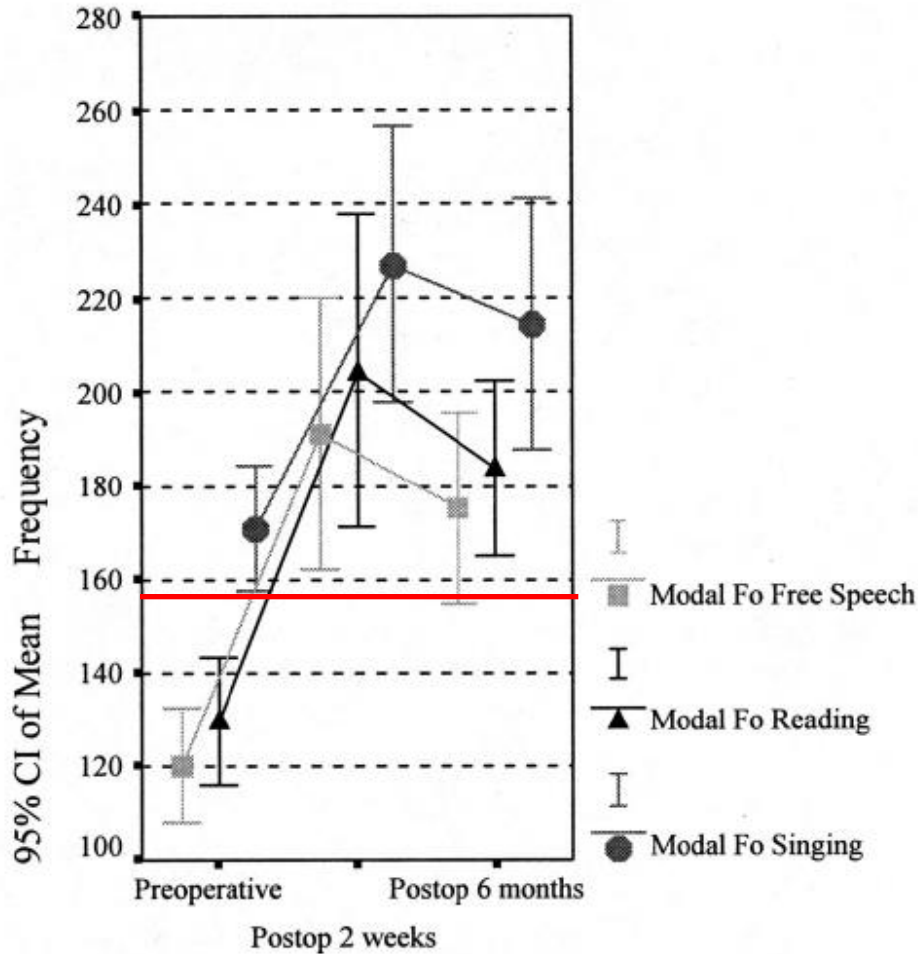


# Objective results

- 21 Male-to-female transsexuals undergoing CTA
- Mean age = 39 (range, 25 – 55 years)
- 4/21 smokers
- 20/21 had simultaneous thyroid chondroplasty
- Median post-operative stay of 1 day (range, 1-3)
- No immediate post-op complications



# CTA improves pitch...



# In summary

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## Cricothyroid Approximation and Subluxation in 21 Male-to-Female Transsexuals

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Anthony D. Cheesman, FRCS, MRCSLT

**Objectives:** To evaluate the medium-term outcome of cricothyroid approximation and subluxation (CTAS) with postoperative speech therapy for pitch elevation in male-to-female transsexuals.  
**Study Design:** Retrospective study of male-to-female transsexuals who underwent pitch-raising surgery between November 1996 and August 2001.  
**Methods:** Twenty-one male-to-female transsexuals opted for surgical feminization of their voices after inadequate improvements with speech therapy alone. Electrolaryngographic measurements were obtained by a single speech therapist of modal fundamental frequencies and the percentage of irregularities before, at 2 weeks, and 6 months after surgery. All 21 patients underwent CTAS, and 20 underwent simultaneous cosmetic thyroid chondroplasty by a single surgeon.  
**Results:** Electrolaryngographic results 2 weeks after surgery showed an average postoperative gain in modal frequency of free speech of 71.05 Hz (95% confidence interval [CI]: 42.9–99.2,  $P < .001$ ). There was a concomitant average rise in irregularities of 9.9% (95% CI 0.7–18.5,  $P = .03$ ). At median follow-up of 6 months after six sessions of speech therapy ( $n = 15$ ), there was a decrease in irregularities to preoperative levels. The overall gain at 6 months in modal frequency of free speech was 56.9 Hz (95% CI 38.3–75.4,  $P < .001$ ). Smoking and age did not predict a worse outcome.  
**Conclusions:** Cricothyroid approximation effectively raises pitch in male-to-female transsexuals. There is a concomitant rise in voice irregularities that is effectively addressed by speech therapy.  
**Key Words:** Pitch-raising surgery, male-to-female transsexual, cricothyroid approximation.

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Kanagalingam et al.: Cricothyroid Approximation/Subluxation in Transsexuals

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	Overall gain	Change in irregularities
Free-speech	57 Hz	+ 5 %
Reading	54 Hz	- 3%
Singing	43 Hz	+ 5 %

### INTRODUCTION

Transsexualism is a recognized disorder of gender identity in which people believe themselves to be born into the "wrong" gender body. The prevalence is estimated at 1 in 37,000 with three quarters being male-to-female transsexuals.<sup>1</sup> Transsexuals are distinct from transvestites and cross-dressers and are not homosexuals. They hate every aspect of their male bodies and may have a history of self-castration and suicide attempts. The acceptance of this disorder has led to a variety of medical and surgical approaches for physical alteration to help male-to-female transsexuals conform to their conceptual sex.

The use of female hormones in oral and periodic parental forms is widely used by male-to-female transsexuals. These lead to smooth finer skin and larger breasts. Surgical procedures are often used after the patient has successfully led a life as a woman for some time. These include genital conversion surgery, mandibular angle contouring, breast augmentation, rhinoplasty, and blepharoplasty.

Although these therapies give patients a female appearance, their masculine voice and prominence of the Adam's apple often remain and are a frequent cause of embarrassment in public. Estrogen has no effect on the vocal cords or laryngeal framework in adulthood, and consequently these patients retain a physiologically male larynx.<sup>2</sup> Even if pitch is raised functionally, in uncontrolled situations like yawning, coughing, laughing, and sneezing, the male voice appears. In some cases, the habitually raised voice may lead to functional and organic voice pathology.

Although much can be done with speech training to achieve perceived femininity in voice without raising pitch, surgical pitch elevation is often necessary. Of the many strategies that have evolved, cricothyroid approximation or cricothyropexy is the most popular. This was first described by Ieshiki et al.<sup>3,4</sup> (Ieshiki's type IV thyroplasty) and was used in a series of 11 patients, all but 1 female, suffering from androphonia. The rationale of this technique is that by increasing vocal fold tension, one can increase fundamental speech frequency. Despite its popu-



# Just to check you were listening



**Female**



**Shemale**



**Female**



**Shemale**



**Shemale**



**Shemale**



**Shemale**



Thank you

