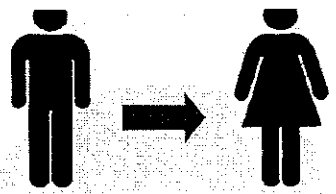
Pitch-raising in transsexual women
Voice therapy / voice surgery or both?

The 7th PEVOC Conference, Groningen, Netherlands, 28/8-1/9 2007



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AIM

The aim of this study was to evaluate the effect of phonosurgery with anterior web formation of the vocal folds. Is it possible to create a **long-lasting female pitch** in transsexual women?

INTRODUCTION

Transsexuals are individuals who believe their psychological gender is not congruent with their biological gender. They are born into the "wrong" body. The speech and language pathologist helps the client to a communicative behaviour congruent with the re-assigned sex.
Many factors contribute to our **identification of gender:** fundamental frequency, resonance, intonation, articulation, voice quality, vocabulary and subjects chosen. The way people cough, laugh and clear their throat is also important as well as their body language. The primary perceptual cue for identifying the sex of the speaker though is the **fundamental frequency** (F_0) which has to exceed 160-165 Hz to be perceived as female. 145-165 Hz is considered a gender-neutral area of pitch.
Female-to-male transsexuals' voices are virilized and thereby lowered in frequency by male hormones. However, no hormone treatment can alter the adult male voice into a female voice. Thus for male-to-female transsexuals either **voice therapy, voice surgery or a combination** is needed. As yet, no consensus exists, whether surgery can guarantee a long-lasting increased pitch.

PARTICIPANTS AND METHOD

Sixteen transsexual women (male-to-female) received therapy which focused on increasing the average pitch as well as on other features of voice and communicative behaviour.
Ten of the clients succeeded in finding a pitch which they found adequate (group A). The remaining six could not accomplish this and therefore underwent anterior web surgery to reduce the vibrating mass of the vocal folds (group B). In anterior web surgery about 1/3 of the anterior part of the vocal folds were de-epithelialized and sutured to create the web.

Facts about the participants (mean and range)

Group	Treatment	N	Age	Height in cm	Smoking	Therapy sessions	Follow-up (months)
A	Voice therapy	10	35 *(21-59)*	181 *(169-193)*	1	13 *(9-18)*	36 *(4*-103)*
B	Voice therapy + surgery	6	47 *(36-61)*	177 *(168-180)*	1	16 *(6-37)*	32 *(18-41)*

*only one below 25 months

RESULTS

Mean ($\bar{x}$) fundamental frequency (F_0) and range pre and post voice therapy and/or surgery and at follow-up

Group	Treatment	$\bar{x}$ F_0 before therapy	$\bar{x}$ F_0 after therapy/op	$\bar{x}$ F_0 at follow-up
A	Voice therapy	132 *(111-147)*	168 *(119-211)*	172 *(131-203)*
B	Voice therapy + surgery	122 *(105-140)*	179 *(142-253)*	157 *(127-177)*

At follow-up 7 out of 10 clients in **group A** had a female pitch, (above 165 Hz), one had a gender-neutral pitch (145-165 Hz) and two had a male pitch. After finishing voice therapy 5/10 has continued to increase pitch and 3 have a slightly reduced pitch (8, 10 and 17 Hz).
In **group B** one client had a female pitch, four clients had a neutral pitch and one had a male pitch at follow-up. Anterior web formation increased F_0 for all six participants. However, **F_0 decreased** dramatically for two of the clients to a level below the average F_0 they had accomplished in voice therapy before surgery. On the other hand 2/6 participants succeeded in increasing their F_0 further after the surgery. We may conclude that the surgery made it possible for them to accomplish this.

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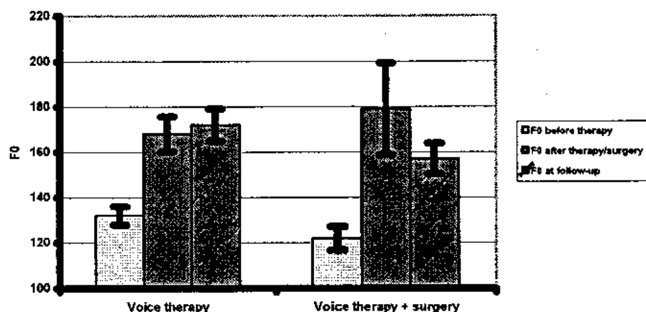

Mean (±S.E.) fundamental frequency (F_0) in group A and B

All patients who underwent surgery still experience problems with reduced loudness and the majority sometimes experience vocal fatigue. In group A one out of ten sometimes finds her voice too weak and two out of ten sometimes experience vocal fatigue.
There was a strong tendency (p=0.064) that the **participants who underwent surgery were older** than the women who were satisfied with voice therapy only. However there was no significant difference between the groups regarding **height** or **number of therapy sessions.**
Mean **mode** in this study was 6-17 Hz lower than mean fundamental frequency.

DISCUSSION

At follow-up 7/10 in group A, (the group with voice therapy only), had a female pitch compared to 1/6 in group B, (the group with voice therapy and voice surgery). The remaining three in group A were relatively satisfied with their pitch in combination with other communicative features. In group B only two were satisfied with the outcome of voice therapy and voice surgery.
The majority of the participants in **group A reported that they now were enabled to control their voice** but this was not the case in group B. This might be **the fundamental problem** – clients with difficulties in altering their voice do not profit enough from voice therapy. The problem is that they do not seem to profit from voice surgery either.
The difference in age between the groups may contribute to the difference but further research is needed. In future anterior web surgery maybe the web should be extended to create an even shorter vibrating mass of the vocal folds.

CONCLUSIONS

1. Anterior web formation surgery **may not be efficient enough** to create a long-lasting female pitch

2. Some transsexual women seem to have the **necessary prerequisites** to succeed in increasing their fundamental frequency to a female level and often succeed with voice therapy only.
   Those who do not succeed are referred to surgery which in a few cases can accomplish the desired result – a female pitch.

3. **Always voice (actually communication) therapy first!**

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Further reading

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