

The evaluation of results of surgical and conservative voice therapy in MtF transsexuals

Subjective perception of the male to female voice transformation



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Introduction

Voice as important means of communication is an integral part of the overall MtF transsexual transformation. Every patient undergoing MtF transition, perceive her need to work on voice modification individually. Whilst voice might be a primary problem for some of them (especially vocal professionals), other MtF patients do not consider voice perception as important, or just marginally. Currently, in the case of these patients, used both surgical and conservative option for the voice modification treatment.

The most important factors affecting MtF patients' motivation for therapy and therefore the effectiveness of a treatment are: age, musicality, education and voice-career classification, physical disposition.

A group of patients that decides to work with their voices then have a choice of reeducation or surgery. MtF patients that expect immediate change are often not willing to exercise and choose surgical treatment as a first choice. Nevertheless, it is important to emphasize that, as for every scheduled treatment, a surgery is to be preceded and succeeded by voice therapy / reeducation. Conservative therapy is a long-term (usually several-month-lasting) matter and is not suitable for every MtF patient (see factors affecting motivation and voice perception).

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Patients

In this study were compared and considered success of therapy treatment of two groups of MtF patients. First a group of 9 patients after phono-surgery (cricothyroid approximation - thyroplasty type IV), second group of 4 patients that underwent solely through conservative voice therapy.

The conservative voice therapy lasted 6 to 12 months (with respect to each individual patient). In the therapy each patient learnt to use her voice in voice professional way. It contained the work with the breath, the voice usage, body gesture and face mimicry.

Methods

All voice recordings of patients (before and after treatment) were analyzed by software ParVRP (in MATLAB), that provide analysis of acoustical parameters of speaking range profile (SRP) based on spectral analysis and periodicity and amplitude perturbation analysis.

Subjective perception of voice modification were analysed by two sets of listening test. First based on CAPE-V protocol (Kempster, G. B et al.). The following parameters were subjectively evaluated by authors (scientist, lector of singing and voice): breathiness, loudness, overall severity, pitch, roughness, strain and evaluation of the subjective sex perception. Second listening test contains paired comparison of randomly ordered recordings before an after the treatment for each patient, in which were evaluated the amount of changes and the effect on the voice quality and the sex perception.

All parameters were assessed on the 20 points Visual-analog scales.

Results

For the first (phono-surgery) group, voice recordings showed an increase of the pitch in the range of 1-9 semitones (mean 5.42 semitone) after surgery. A statistically significant increase of parameters overall severity, strain was achieved in whole group. In general the voice of patients after surgery featured breathiness and was thick and gruff. The voice also seemed to be unnatural for most of patients, but statistically significantly increased the "like female" perception of voice.

In the second group, an increase in the range of 6 to 9 semitones of the pitch was achieved after the voice therapy. It was only statistically significant change in the sex perception of the voice after treatment. Reeducated patients learnt to master the basic voice technique, used soft voice onsets. Their voice was more musical, firm. The voice seemed to be more natural with no signs of pathology in comparison to the group of surgically treated patients.

With respect to aspects of voice recordings (text read, short recording, recording process background – unfamiliar environment, doctor) only basic voice characteristics could be evaluated – breathiness, resonance, roughness, articulation, strain, timbre, overall impression.

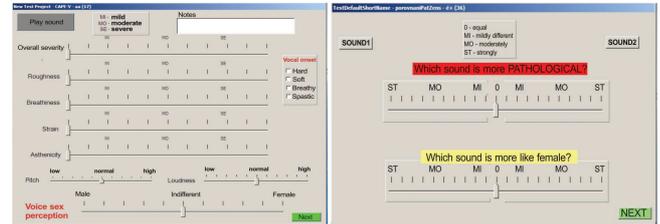


Figure 1 Design of listening tests. First test was based on CAPE-V protocol (Kempster, G. B et al.), evaluated parameters: Overall severity, Roughness, Breathiness, Strain, Asthenicity, Pitch, Loudness, special parameters: Voice sex perception and Vocal onsets. Second test compared Pathology and vocal sex perception before and after treatment. All parameters judged on 20 points Visual-analog scales.

Speech range profiles – the best and the worst results before and after treatment

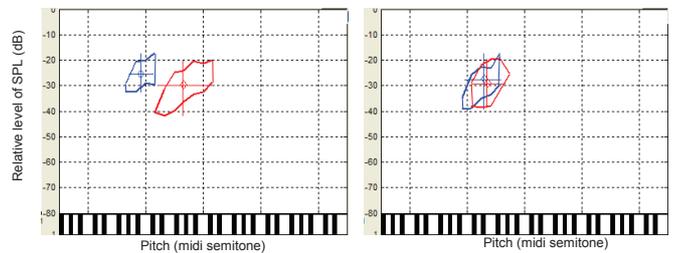


Figure 2 Speech range profiles (SRP) of the best (on the left) and the worst (on the right) results of voice reeducation group. Blue indicate boundaries of SRP before and red one after reeducation. Horizontal / vertical lines represent pitch / SPL ranges. ◊ indicates mean pitch and SPL position of the SRP.

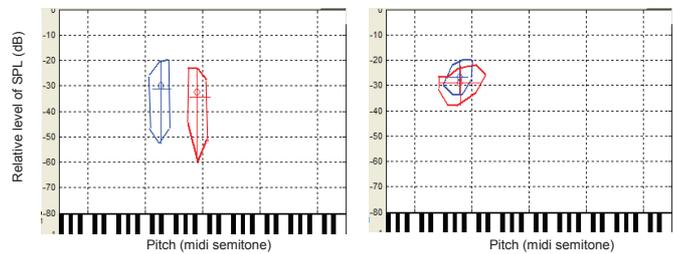


Figure 3 Speech range profiles (SRP) of the best (on the left) and the worst (on the right) results of surgery group. Blue indicate boundaries of SRP before and red one after surgery. Horizontal / vertical lines represents pitch / SPL ranges. ◊ indicates mean pitch and SPL position of the SRP.

Discussion and conclusion

The listening tests showed that, only subjective sex perception had changed significantly (towards female) for rehabilitated MtF patients after therapy while for patients after surgery also impairment of other voice quality parameters had been observed (Strain and Overall severity-increased).

Although, used recordings gave no possibility to evaluate additional voice qualities important for subjective perception of voice modification (prosody, work with voice and breath, stability of voice and sonority), MtF patients that passed only the surgical treatment had not acquired any additional theoretical knowledge nor practical skills on how to further work with their voice to sound as naturally feminine.

As far as, patient assessed as inappropriate only for conservative therapy, or primarily demands fast timbre shift, it could be considered a combination of surgical treatment and voice reeducation as optimal. However, both conservative and surgical voice therapy do not automatically guarantee the achievement of desired voice quality.

A complex voice work can be considered as the greatest advantage of the conservative voice therapy in MtF patients, while the long-term therapy as its drawback. The biggest advantage of the surgery is instant change of the pitch. But the subjective voice perception as well as satisfactory increase of pitch into female range may not always be achieved.

Reference

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Table 1: The results of listening tests. Statistically significant ($p < 0.05$) interjudge correlation in CAPE-V were obtained only for parameters Breathiness, Overall severity, Pitch, Roughness, Strain and Sex perception. The comparison of results before and after treatment shows significant changes in Sex perception for both groups, but significant increasing of Overall severity (impaired voice quality) and Strain in surgery group.

		Asthenicity	Breathiness	Loudness	Overall severity	Pitch	Roughness	Strain	Sex perception
Inter-judge correlation	r	ns	0,64	ns	0,68	0,38	0,53	0,83	0,63
Reeducation	before		1,37		1,75	5,5	0,62	0,43	3,31
	after		2,687		3,25	6,18	0,75	0,68	7,43
	ttest		0,11		0,06	0,33	0,59	0,40	0,02
Surgery	before		1,47		3,25	4,91	2,69	1,75	3,02
	after		2,27		4,61	6,13	3,33	3,30	4,77
	ttest		0,12		0,00	0,00	0,18	0,01	0,00

Table 2: The results of listening test for the Sex perception for both of listeners.

		Surgery (9)				Reeducation (4)			
		before		after		before		after	
Resp.		KK	MF	KK	MF	KK	MF	KK	MF
more feminine	1	2	2	2	5	1	0	4	3
indifferent	2	2	1	3	0	3	0	1	
more masculine	6	5	6	1	3	1	0	0	