



# The results of steroid injection on vocal fold polyps

## Vokal kord poliplerinde steroid enjeksiyon sonuçlarımız

Zeynep Aydođdu,<sup>1</sup> Ziya Saltürk,<sup>1</sup> Güven Yıldırım,<sup>1</sup> Tolgar Lütü Kumral,<sup>1</sup>  
İmran Aydođdu,<sup>2</sup> Erdi Özdemir,<sup>1</sup> Yavuz Uyar<sup>1</sup>

<sup>1</sup>Department of Otolaryngology, Okmeydanı Training and Research Hospital, İstanbul, Turkey

<sup>2</sup>Department of Otolaryngology, Bahçelievler State Hospital, İstanbul, Turkey

### ABSTRACT

**Objectives:** This study aims to evaluate the results that we obtained after injection of steroid into vocal fold polyps.

**Patients and Methods:** Clinical data on 18 patients (12 males, 6 females; mean age 34.4 years; range 25 to 56 years) who had received triamcinolone injections into vocal fold polyps between March and June 2015 were retrospectively analyzed. Patients were examined at first and third weeks, and third months, after treatment, with videolaryngostroboscopy being performed at the last visit.

**Results:** All patients had unilateral vocal fold polyps. No any complication was seen after the operation.

**Conclusion:** Small polyps in vocal folds can be treated via intralaryngeal steroid injection.

**Keywords:** Injection; steroid; vocal polyp.

### ÖZ

**Amaç:** Bu çalışmada vokal kord polipi içine steroid enjeksiyonu sonrası elde edilen sonuçları değerlendirildi.

**Hastalar ve Yöntemler:** Mart 2015 - Haziran 2015 tarihleri arasında vokal kord polipi içine triamnisolon enjeksiyonu yapılan 18 hastanın (12 erkek, 6 kadın; ort. yaş 34.4 yıl; dağılım 25-56 yıl) klinik verileri retrospektif olarak incelendi. Hastalar ameliyat sonrası birinci hafta ve üçüncü hafta ve üçüncü ayda muayene edilerek videolarinoskopik sonuçları incelendi.

**Bulgular:** Hastaların tümünde vokal kord polibi tek taraflı idi. Ameliyat sonucunda herhangi bir komplikasyon görülmedi.

**Sonuç:** Vokal kordlarda yerleşik küçük polipler intralarengeal steroid enjeksiyonu ile tedavi edilebilir.

**Anahtar sözcükler:** Enjeksiyon; steroid; vokal polip.

Benign lesions of the vocal folds are very common, being present in approximately 50% of dysphonic patients. Such lesions are usually caused by vibratory trauma. Viral infections, congenital diseases, allergies, smoking, intubation, and reflux, are other possible causes.<sup>[1]</sup> Nodules, polyps, Reinke's edema, granuloma, and cysts are common benign lesions of the vocal folds.<sup>[2]</sup> Voice therapy and surgery are the principal therapeutic modalities.

Vocal fold polyps are usually unilateral, exophytic, translucent, and sometimes hemorrhagic. Such lesions

are caused principally by vocal trauma. Polyps also develop in patients prescribed salicylate or anticoagulant therapy.

The principal therapeutic approach is surgery. Corticosteroid injections were introduced by Yanagihara in 1967.<sup>[3]</sup> Steroid injections were initially delivered with the aid of a laryngeal mirror, but after the development of fiberoptic laryngoscopy, the technique was improved and rendered more comfortable for patients.

The main objective to analyze our experience with steroid injections of vocal fold polyps.

Received: April 04, 2016 Accepted: August 05, 2016

Correspondence: Zeynep Aydođdu, MD. Okmeydanı Eğitim ve Araştırma Hastanesi Kulak Burun Boğaz Hastalıkları Kliniđi, 34384 Okmeydanı, İstanbul, Turkey.

Tel: 0212 - 221 77 77 e-mail: zeynepkbck@hotmail.com

© 2016 Official Journal of ENT-HNS Society of İstanbul

## PATIENTS AND METHODS

Institutional Review Board approval for this study was obtained from the Okmeydanı Training and Research Hospital Ethics Committee, and written informed consent was obtained from each patient. The study was conducted in accordance with the principles of the Declaration of Helsinki. Data on 18 patients (12 males, 6 females; mean age 34.4 years; range 25-56 years) who had received triamcinolone injections into vocal fold polyps by Dr. Ziya Saltürk through cricothyroid membrane on opposite site between March and June 2015 were retrospectively analyzed. All pretreatment and postoperative videolaryngostroboscopic (Karl Storz Pulsar II 40160120) records were analyzed in terms of amplitude, the mucosal wave, the non-vibratory area, smoothness, and closing pattern with using stroboscopy rating form that developed by Poburka.<sup>[4]</sup> Polyps were grouped in terms of size. The first group contained polyps that filled >50% of the cavity between two vocal folds. The second group was composed of polyps that filled 25-50% of the cavity, and the third group polyps that filled <25% of the cavity. All polyps were injected with 2 mL triamcinolone acetonide suspension (40 mg/mL) solution under local anesthesia. Triamcinolone acetonide suspension (40 mg/mL) was injected transcutaneously through the cricothyroid membrane using a 26-gauge 1.5-inch needle on a 1 mL disposable plastic syringe. Lidocaine spray (10 mg/mL) was used to block the superior laryngeal nerve. Patients were evaluated three months after operation. For subjective evaluation, we administered the Turkish version of the Voice Handicap Index VHI-10 questionnaire was administered before procedure and after at results control to all patients. This was translated from the English and validated by Kiliç et al.<sup>[5]</sup> The VHI-10 contains 10 questions, each of which is scored from 0 to 4. The paired samples t-test was used in data analysis.

## RESULTS

All patients had unilateral vocal fold polyps. In group 1 all vocal polyps size were healed completely, in group 2

all vocal polyps size were reduced, in group 3 there was no significant difference in size. Polyp size distribution is shown in Table 1.

Patients were examined one and three weeks, and three months, after treatment, with videolaryngostroboscopy being performed at the last visit. In group 1 all findings (muosal wave, nonvibrating, vocal fold edge smoothness, vocal fold edge straightness, vertical level, phase closure, phase symmetry, regularity and glottik closure) were completely improved in videolaryngostroboscopy. In group 2 improvement was observed but it was not complete. In group 3 there was no significant difference. Table 2 illustrates stroboscopy analysis.

In group 1 VHI was  $13.44 \pm 5.61$  before treatment,  $4.34 \pm 5.21$  third month after treatment. The mean VHI-10 score remained significantly improved at the third month after treatment control ( $p < 0.05$ ). No significant change was detected at group 2 and 3. Table 3 lists the VHI-10 test results.

## DISCUSSION

The aim of therapy in patients with vocal fold disease is to eliminate the etiological factor(s) and to treat the pathology conservatively. Surgery should be reserved for cases that do not respond to conservative therapy.<sup>[6]</sup> Vocal hygiene training and voice therapy are alternatives to classical therapy (surgery).<sup>[6]</sup>

Corticosteroids are used to treat benign vocal fold lesions because they exert anti-inflammatory effects. Corticosteroids prevent inflammation and reduce the formation of granulation tissue. The steroids prevent fibroblast proliferation and migration. Thus, the vocal fold polyps regress because further collagen production is prevented.<sup>[7]</sup> Costicosteroids are most effective when used to treat hemorrhagic, fibrous, and fusiform polyps.<sup>[8]</sup> We found that polyp size was also an important determinant of prognosis. As polyp size decreased, the extent of regression increased. Tateya et al.<sup>[9]</sup> injected 27 polyps with steroids; 17 polyps regressed completely and 10 partially. Mortensen and Woo<sup>[8]</sup> injected corticosteroids into 18 polyps or nodules of 18 patients, of whom none required later surgery. Other

Preoperative	n	%	First week	Third month
Group 1	6	<25	Reduced	Completely resolved
Group 2	6	25-50	Reduced	Reduced, not completely resolved (<%25)
Group 3	6	<50	No change	No change

**Table 2**  
Laryngostroboscopic results

	Group 1 (n=6)			Group 2 (n=6)			Group 3 (n=6)		
	Preoperative	Third month	p	Preoperative	Third month	p	Preoperative	Third month	p
Amplitude (n)	10	10	>0.05	10	10	>0.05	10	10	>0.05
Mucosal wave (n)	8	10	>0.05	4-6	8	>0.05	2-4	2-4	>0.05
Non-vibrating portion (%)	20	0	<0.05	40	20	>0.05	50	50	>0.05
Supraglottic activity (n)	0	0	>0.05	1	0	>0.05	2	2	>0.05
Vocal fold edge smoothness (n)	1	0	<0.05	3	2	>0.05	4	4	>0.05
Vocal fold edge straightness (n)	1	0	<0.05	3	2	>0.05	4	4	>0.05
Vertical level (n)	Off-plane	On-plane	>0.05	Off-plane	Off-plane	>0.05	Off-plane	Off-plane	>0.05
Phase closure (%)	33	<10	<0.05	66	33	<0.05	>90	>90	>0.05
Phase symmetry (%)	80	100	>0.05	60	80	>0.05	40	40	>0.05
Regularity (%)	80	100	>0.05	60	80	>0.05	40	40	>0.05
Glottal closure	Hourglass	Normal		Hourglass	Hourglass		Hourglass	Hourglass	

**Table 3**  
Voice handicap index results of patients

	n	Before treatment	Third month after treatment	p
		Mean±SD	Mean±SD	
Group 1	6	13.44±5.61	4.34±5.12	<0.05
Group 2	6	9.33±3.78	6.34±3.23	>0.05
Group 3	6	5.12±2.34	2.34±1.89	>0.05

SD: Standard deviation.

studies have found that steroid injection improved the voice quality of patients with Reinke’s edema.<sup>[10,11]</sup> Although both glandular and mucosal atrophy have been reported as complications developing after steroid injection,<sup>[12]</sup> we did not note any complication in our patients.

The main limitation of our study was limited number of our patients and short follow-up time. Studies with larger cohort and longer follow-up period are required.

The principal advantage of steroid therapy is the possibility of reinjection (if needed) and the low complication rate, as compared to that after surgery.<sup>[7]</sup> In addition, local drug administration is advantageous in patients who cannot tolerate general anesthesia. We delivered the corticosteroid through the cricothyroid membrane. The principal advantage of using this route is that the gag reflex is avoided.

**Declaration of conflicting interests**

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

**Funding**

The authors received no financial support for the research and/or authorship of this article.

**REFERENCES**

- Cummings CW, editor. Otolaryngology Head and Neck Surgery. 4th ed. Philadelphia: Elsevier, Mosby; 2007. p. 2155-61.
- Benjamin B. Vocal cord polyps. In: Benjamin B, editor. Endolaryngeal Surgery. London: Martin Dunitz; 1998. p. 237-40.
- Yanagihara N, Azuma F, Koike Y, Honjo I, Imanishi Y. Intracordal injection of dexamethasone. Practica Otorhinolaryngol 1964;57:496-500.
- Poburka BJ. A new stroboscopy rating form. J Voice 1999;13:403-13.
- Kiliç MA, Okur E, Yildirim I, Oğüt F, Denizoğlu I, Kizilay A, et al. Reliability and validity of the Turkish

- version of the Voice Handicap Index. [Article in Turkish] *Kulak Burun Bogaz Ihtis Derg* 2008;18:139-47.
6. Srirompotong S, Saeseow P, Vatanasapt P. Small vocal cord polyps: completely resolved with conservative treatment. *Southeast Asian J Trop Med Public Health* 2004;35:169-71.
  7. Hsu YB, Lan MC, Chang SY. Percutaneous corticosteroid injection for vocal fold polyp. *Arch Otolaryngol Head Neck Surg* 2009;135:776-80.
  8. Mortensen M, Woo P. Office steroid injections of the larynx. *Laryngoscope* 2006;116:1735-9.
  9. Tateya I, Omori K, Kojima H, Hirano S, Kaneko K, Ito J. Steroid injection to vocal nodules using fiberoptic laryngeal surgery under topical anesthesia. *Eur Arch Otorhinolaryngol* 2004;261:489-92.
  10. Tateya I. Laryngeal steroid injection. *Curr Opin Otolaryngol Head Neck Surg* 2009;17:424-6.
  11. Campagnolo AM, Tsuji DH, Sennes LU, Imamura R. Steroid injection in chronic inflammatory vocal fold disorders, literature review. *Braz J Otorhinolaryngol* 2008;74:926-32.
  12. Benjamin B. Vocal nodules. In: Benjamin B, editor. *Endo-Laryngeal Surgery*. London: Dunitz; 1998. p. 113-24.