

Olfactory Nerve Injuries: A Short Literature Review

Hashem Shemshadi

Rofeideh Rehabilitation Hospital, Iran

The main purpose of this short review literature, is to elaborate some of the common causes of olfactory nerve injuries. As the nanoparticles stimulate the olfactory mucosa, an electrochemical initiation will start. The message as an afferent stimulus, passes through the ethmoid bone cribriform plate for delivering such memorandum toward the central nervous system. Thus, the sense of smell will be detected and translated to a pleasant and or non-pleasant memory narration. Skull injures such as a coup - counter coup in a blunt trauma, central nervous system's infections such viral infection (COVID-19), bacterial meningitis, tumors and surgical manipulations such as nasal operations, may be considered as some common cause of olfactory nerve damages. Restoration of olfactory nerve after the damages due to the aforementioned causes, depends on the source and the grade of the damage. Some tough injuries may even result complete and/or permanent loss of smell (anosmia). Some complete losses may gradually regenerate from anosmia to hyposmia and in follow leading to complete recovery of normal smell functioning.

Introduction: The principal stage in this brief review article is to exam different causes of trauma to the olfactory nerve and stick with its revival aftermath. Olfactory nerve as being a part of our memories, play significant roles in our social communication (1).

In cases who contracted chronic rhino-sinusitis or injured severely from surgical trauma with damaging the olfactory bulbs and olfactory nerve tract with fracture of the ethmoid bone, recovery is much longer (2), (3).

Young Il Joung and colleagues from Hamyang University Medical Center, Korea, reported 102 patients with head and neck trauma who had parenchymal hemorrhage or contusion on skull frontal base, 9 of them found to have anosmia. The anosmia time recovery for above mentioned patients ranged from zero to 24 months (4).

We did examine olfactory nerve damage in patients who underwent open rhinoplasty in the past. The research report was issued in November 2008 in PubMed. We tried to investigate "when" the olfactory function recovers to its normal preoperative levels. In this pre and post operative research design, 40 of 65 esthetics open rhinoplasty candidates with equal gender distribution, who met the inclusion criteria, were assessed. Their olfactory function using the Smell Identification Test (SIT) by using 40 culturally familiar odors in sniffing bottles. All the patients were evaluated for the SIT scores preoperatively and postoperatively (at week 1, week 6, and month 6). At postoperative week one, 87.5% of the patients had anosmia. At postoperative week six, 85% of the subjects experienced mild to moderate degrees of hyposmia. At the six months postoperative, all patients' olfactory function, reverted to their preoperative levels. A repeated ANOVA was indicative of significant differences in the olfactory function at the above-mentioned different time points. According to our post hoc Benfrouney, the preoperative scores had a significant difference with those at postoperative week 1, week 6, but not with the ones at month 6. Thus, the primary cosmetic open rhinoplasty may be accompanied by some degrees of postoperative olfactory dysfunction. Patients need a time interval of 6 weeks to 6 months to fully recover from surgical manipulation and respective edema into their preoperative baseline olfactory function (5). Neurotrophic viruses, which inhibit nervous system progression, also may contribute to anosmia. These viruses apparently are more

atypical and or more aggressive in comparison to other viruses. Such bugs hinder olfactory nerve improvements by their harmfulness effects on the neurons. In recently COVID-19 pandemic event, some patients who most probably had been affected by the virus, anosmia was one of their imperative clinical features. Referable to the virus rigorousness and its non-typicality, it is currently assumed, presenting with anosmia, may be employed as an assisting clinical indicator for patients who have the COVID-19 disease (6). Still ongoing publications and suggestions for a better preventing, diagnosing and treating above mentioned viral disease, arriving on world-widely. Appropriate medications and its effective vaccines are also being debated comprehensively. Abnormal exposures to chemicals and smokes, may also contribute to olfactory nerve harms. Improving their anosmia due to the above named causes, is to turn off their exposure within an effective time interval in exposing to the above said substances (7, 8).

References

1. Mitwa T, Furukawa M, Tusukatani T, Costanzo RM, DiNardo LJ, Reiter ER: impact of olfactory impairment on quality of life and disability Arch Otolaryngol Head and Neck Surgery 127:497-503 2001
2. Doty RL, Mishra A (March 2001). "Olfaction and its alteration by nasal obstruction, rhinitis, and rhinosinusitis". The Laryngoscope. 111 (3): 409-23. doi:10.1097/00005537-200103000-00008. PMID 11224769.
3. Doty RL, Yousem DM, Pham LT, Kreshak AA, Geckle R, Lee WW (September 1997). "Olfactory dysfunction in patients with head trauma". Archives of Neurology. 54 (9): 1131-40. doi:10.1001/archneur.1997.00550210061014. PMID 9311357.
4. Young Il Joung MD, Hyeong Joong Yi MD, Seung Ku Lee MD, Tai-Ho Im MD, Seok Hyun Cho MD, Yong Ko, MDP: Posttraumatic anosmia and ageusia: incidence and recovery with relevance to hemorrhage and fracture on the frontal base. J Korean Neurolog 42:1-5 2007
5. Hashem Shemshadi, 1,3 Mojtaba Azimian, 1 Mohammad Ali Onori, 1 and Mahdi AzizAbadi Farahani, Olfactory function following open rhinoplasty: A 6-month follow-up study, BMC Ear Nose Throat Disord. 2008; 8: 6. Published online 2008 Oct 3. doi: 10.1186/1472-6815-8-6
6. Moein, Shima T.; Hashemian, Seyed M.R.; Mansourafshar, Babak; Khorram-Tousi, Ali; Tabarsi, Payam; Doty, Richard L. (17 April 2020). "Smell dysfunction: a biomarker for COVID-19". International Forum of Allergy & Rhinology. doi:10.1002/alr.22587.
7. Schwartz BS, Doty RL, Monroe C, Frye R, Barker S (May 1989). "Olfactory function in chemical workers exposed to acrylate and methacrylate vapors". American Journal of Public Health. 79 (5): 613-8. doi:10.2105/AJPH.79.5.613. PMC 1349504. PMID 2784947.
8. Rose CS, Heywood PG, Costanzo RM (June 1992). "Olfactory impairment after chronic occupational cadmium exposure". Journal of Occupational Medicine. 34 (6): 600-5. PMID 1619490.