Daith piercing - vagus nerve stimulation and migraine prophylaxis

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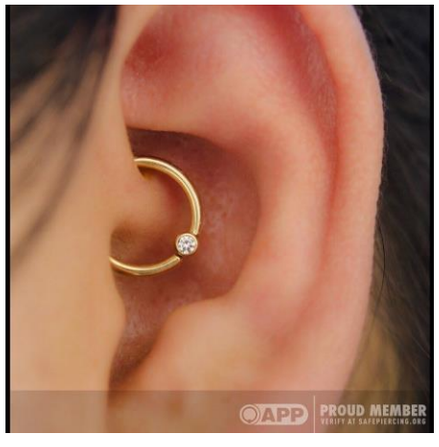
Introduction

- Daith ear piercing has been associated with anecdotal reports of reduced migraines for over 20 years.
- Three recent retrospective surveys by the authors of over 3000 respondents (of which 500 had migraines >10yrs and piercing >12mths) suggest a long-lasting clinical response that can include complete cessation of migraines.
- Daith piercing passes through a ridge of cartilage innervated by the vagus nerve, and vagal stimulation is a treatment for epilepsy[1] and migraine[2].
- Other ear piercings do not involve the vagus and are <u>not</u> associated with migraine reduction.
- Recent anecdotal reports from piercers suggest an immediate improvement in visual comfort directly after piercing, as well as improvement in headache and other symptoms.

Objectives

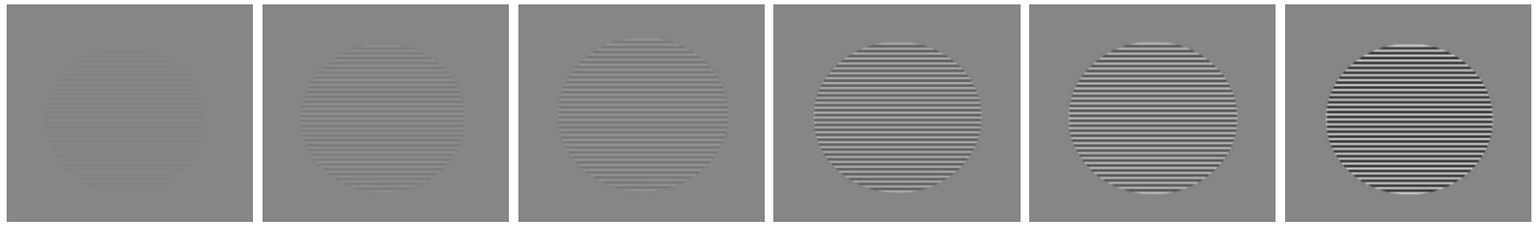
1. **To measure visual discomfort before and immediately after Daith piercing**
2. **To record symptoms before and immediately after piercing**
3. **To assess any change in headache incidence after 1-3 months**



Methods

- 40 consecutive patients (39 women) underwent Daith piercing as treatment for longstanding headache
- Visual discomfort was assessed before and immediately after piercing and compared with normative data from a control group of 40 healthy women
- Patients observed gratings of increasing contrast and rated their discomfort

  (Ten gratings shown sequentially were horizontal, circular in outline, subtending 10 degrees; they had a square-wave luminance profile, a spatial frequency of three cycles per degree and increased linearly in log contrast from 2.7% to 94%).
- Patients were followed up 1-3 months after piercing



Results

- **Control group: - no visual discomfort in any volunteer**
- **Patient group: follow-up data available for 34/40 (74%) patients at >1 month after piercing:-**

Reported improvement at 1-3 months* (Reported at follow-up)	**N**	**Severe visual discomfort from patterns**			**Headache days per month (SD)** (Reported at follow-up)	
		Before piercing	Immediately after piercing		Before piercing	1-3 months after piercing
"None"	8	0	0		20.2 (13.6)	21.1 (12.4)
“A little"	13	8	1		13.6 (12.9)	6.4 (7.5)
“Great"	13	7	2		15.3 (9.8)	2.0 (2.8)
* "Overall, how has your Daith Piercing altered your migraines/severe headaches?"						

- The non-responders had no change across a range of symptoms recorded, suggesting a separate non-responder group
- Fisher’s exact test comparing 0/8 non-responders to 15/26 responders prior to piercing $p<.005$. There is no significant difference between those reporting “A little” and “Great” improvement in their migraines, and 3 people reported total cessation of headache

Conclusion

- **These results indicate that:-**
  - **Daith piercing causes an immediate measurable effect within the brain**
  - **Daith piercing significantly reduces headache symptoms in many but not all migraineurs**
  - **Headache reduction was predicted by responses to visual stimuli**
- **The results are also consistent with our retrospective surveys of 3000 migraineurs with Daith piercing[5]**
- **The observed changes are consistent with Daith piercing stimulating the vagus nerve:-**
  - **Visual discomfort from high contrast grating patterns reflects cortical excitability in migraine[3,4]**
  - **Electrical stimulation of the vagus nerve reduces cortical excitability[1]**
  - **Electrical stimulation of the auricular branch of the vagus nerve is used to treat migraines[2]**
- **Further research, potentially including fMRI studies before and after piercing, is justified**
- **Daith piercing is simple, easily available, inexpensive and already widely used by migraineurs**
- **If long-term effects are confirmed by further research, it could be a useful and effective treatment option**

References

1. Englot DJ, Chang EF, Auguste KI (2011). *Journal of Neurosurgery* 2011;115:1248-55
2. Straub A, Ellrich J, Eren O et al (2015). *J Headache Pain,* 2015, 16:543
3. Huang J, Zong X, Wilkins A et al (2011). *Cephalalgia* , **31**(8), 925-936
4. Huang J, Cooper TG, Satana B, Kaufman DI, Cao Y. *Headache* 2003;43: 664-71
5. Further data available from the authors