

Consequences of Eye Amputation with Emphasis on Phantom Eye Syndrome

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Moreover, as few articles about the phantom eye syndrome were found, some articles that contain information about phantom pain in eye and in other limbs, than the eye, have also been selected, since the principle that leads to some phantom pain is the same for all organs.

Despite being published in another period than the determined in inclusion and exclusion criteria, some studies about phantom eye syndrome were also included [6], because they are hallowed in literature and have great importance in the subject of this study.

Results

By using the keywords mentioned, 167 articles were found in database, 13 of which were selected to compose this review, according to the inclusion and exclusion criteria. We also included studies contained in the references of selected articles that are relevant to the purpose of this review but were not found in the search using the keywords proposed. Some studies about phantom eye syndrome were also included, since they are hallowed in literature and have great importance in the subject of this study.

Review and Discussion

The phantom eye syndrome is associated with visual hallucinations, phantom pain, and phantom sensations.

Visual Hallucinations

Visual hallucinations are illusory perceptions in the removed eye owing a sense of reality but occurring without external stimulation of the sensory organ. People, animals, buildings, and scenery are most often reported. The vision is described as well-defined, organized, and clear and may represent a release of the visual association cortex from vision; however, its mechanism is poorly understood [7].

Visual hallucinations may be elementary or complex. Elementary visual hallucinations include simple visual phenomena lacking meaning and form, while complex visual hallucinations consist of formed contours, objects, scenes, or persons, sometimes related to past experiences of the subject. The elementary and complex hallucinations might be thought of as true hallucinations; that is, something which is not present in the external world is perceived.

Probably because of the variety of levels and etiologies, the literature shows no consistent suggestions of either the factors triggering such hallucinations, the conditions necessary and sufficient to sustain them, or the effective methods of their suppression [8]. These hallucinations typically occur independently of any triggering factors or exercise of volition in the genesis of the image. In some individuals, however, they may be triggered by a wide variety of stimuli such as conditions of general sensory reduction, fatigue, stress, and low levels of illumination or even by bright light.

According to Kolmel, onset is typically within a few days of the

event causing the anophthalmia and frequency generally decreases over time. Once manifested, images last for periods varying from seconds through minutes to hours. Santhouse et al. reported that, from 123 patients with hallucinations, 68% related that hallucinations occurred at least daily, with 23% hallucinating at least hourly or constantly.

There was a tendency for hallucinations to last for minutes, rather than seconds or hours. These hallucinations can subsequently disappear [9], either spontaneously or in response to actions such as closing the eyes.

There are reports that these hallucinations may surcease in a period between a few weeks and 6 months after the eye amputation.

Phantom vision is a real and detailed phenomenon that is a concern to patients. Historically, hallucinatory experiences have been deemed the sense hallucinations.

amputation. However, phantom pain may be delayed for months or years. Most patients with phantom pain have intermittent pain, with intervals that range from 1 day to several weeks. Even intervals of over a year have been reported. The pain often presents itself in the form of attacks that vary in duration from a few seconds to minutes or hours.

The pain coming from an anophthalmic cavity is originated from a dysfunctional cavity, indicating that there is a structural or pathological cause for pain, such as, conjunctival cysts, migration of the implant, lacrimal insufficiency, infectious or inflammatory conditions, tumors, hematoma, residual silicone, brain and diseases, compression or irritation of the trigeminal nerve, psychological causes, and the need for modification of prostheses [11]. As there are no studies that describe the quality of the phantom eye pain, the comparison is made with studies about phantom pain in amputated limbs, and in those cases, the phantom limb pain is often described as shooting, stabbing, penetration, cramps, pinch, burning, crushing, shocking, sticking, and cramping.

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7. Rose GE, Wright JE (1994) Exenteration for benign orbital disease. *Br J Ophthalmol* 78: 14– 18.
8. Rasmussen MLR (2010) The eye amputated-consequences of eye amputation with emphasis on clinical aspects, phantom eye syndrome and quality of life. *Acta Ophthalmologica* 88: 1–26.
9. Shoamanesh A, Pang NK, Oestreicher JH (2007) Complications of orbital implants: a review of 542 patients who have undergone orbital implantation and 275 subsequent peg placements. *Orbit* 26: 173–182.
10. Rasmussen MLR, Prause JU, Ocularist MJ, Toft PB (2009) Phantom eye syndrome: types of visual hallucinations and related phenomena. *Ophthalmic Plast Reconstr Surg* 25: 390–393.
11. Nicolodi M, Frezzotti R, Diadori A, Nuti A, Sicuteri F, et al. (1997) Phantom eye: features and prevalence. The predisposing role of headache. *Cephalalgia* 17: 501–504.
12. Soros P, Vo O, Husstedt IW, Evers S, Gerding H, et al. (2003) Phantom eye syndrome: its prevalence, phenomenology, and putative mechanisms. *Neurology* 60: 1542–1543.
13. Soros P, Vo O, Husstedt IW, Evers S, Gerding H, et al. (2005) Enucleation and development of cluster headache: a retrospective study. *BMC Neurology* 5: 1-5.