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Tumors of the pituitary and headache: Will it get better after surgery?

Headaches belong to the most common neurological common disorders, with many patterns of presentation, ranging from acute to chronic. Globally, the World Health Organization (WHO) estimates that half of the world's population suffers from headache at least once a year (The World Health Organization. Atlas of headache disorders and resources in the world 2011. © *World Health Organisation. ISBN 978 92 4 156421 2).*

Neurologists differentiate between primary headaches and secondary headaches. Primary headaches make up around 90% of all headaches, most often migraine or tension-type headache, and are not a symptom of an underlying disease. Secondary headaches are a symptom of a condition, which causes the headache, for example a sinusitis, a bleeding or a brain tumor. In the era of wide availability of modern imaging diagnostics, such as computed tomography (CT) or magnetic resonance imaging (MRI) which frequently uncover incidental abnormalities in patients investigated due to headache, it may be hard to differentiate whether a primary headache has led to the chance discovery of a brain pathology or whether the brain pathology is responsible for causing the headache. This is especially difficult in benign tumors, which grow slowly and oftentimes do not produce any noticeable clinical symptoms.

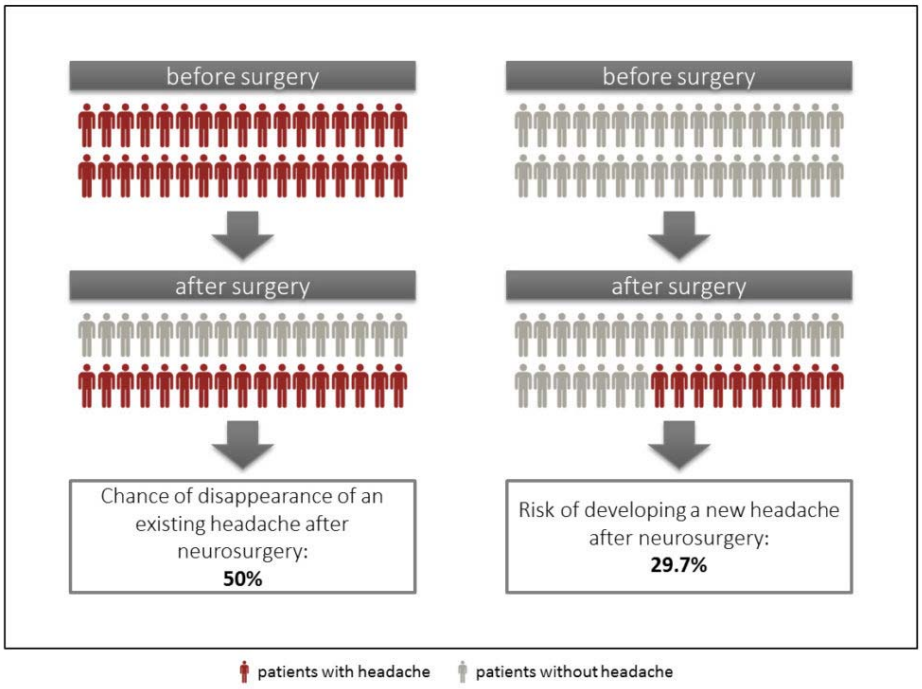

Fig. 1. Comparison of the treatment effect of neurosurgery on 34 patients with headache and 34 patients without headache.

The pituitary is a small gland at the base of the brain, which produces hormones, which in turn regulate all other glands in the body. Benign pituitary tumors, called adenomas and other tumors in the anatomic region of the pituitary, the sellar region, belong to the most common brain tumors. In the United States alone, about 10,000 pituitary tumors are diagnosed each year, mostly pituitary adenomas (https://www.cancer.org/cancer/pituitary-tumors/about/key-statistics.html). Headache is a common presenting feature of patients with pituitary adenomas and other tumors of the sellar region. To explore whether there is a relationship between headache and the pituitary tumor, or if it is just a coincidence of two common pathologies, we examined in detail the headache types, their relationship to the specific peculiarities of the tumor, and if the headache responded to neurosurgery. 112 patients scheduled for first time neurosurgery in a large neurosurgical center filled in headache and depression self-rating inventories before and at least three months after surgical tumor removal. If headache resolved after surgery, it would be a clear indicator that the tumor had caused it. From chart records we extracted all variables thought to impact on headache, such as tumor size, growth pattern, invasion into structures carrying pain-sensitive fibers, hormone overproduction, hormone deficiency and others.

Fifty-nine (53%) patients reported to have experienced headache in the three months before neurosurgery, 49 (44%) patients had headache at the time of filling in the questionnaires. Four patients who had an acute bleeding into the pituitary tumor (pituitary apoplexy) reported a characteristic sharp sudden headache type, called thunderclap headache. The other patients had diverse headache types such as migraine, tension-type headache or even headache consistent with medication overuse headache. Those patients with a deficiency of sex hormones due to the pituitary tumor suffered significantly less frequently from headache. Otherwise, none of the investigated tumor characteristics were related to presence of headache or specific headache types. Furthermore, we saw no significant improvement of headache after neurosurgical tumor removal. These results mean that we could not clearly say that the headache experienced by our patients had been caused by the pituitary pathology. We conclude that headache alone is not a valid diagnostic criterion for the presence of tumors of the pituitary gland and its vicinity. A small benign pituitary lesion should not be removed because of headache alone because there is a big chance that it will not get better after surgery.

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