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Pathogenesis and surgical therapy of migraine attacks caused by weather (Foehn) and menstruation

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SUMMARY

This work reports for the first time on the pathological background and the successful definitive surgical treatment of migraine attacks caused by weather (Foehn) changes, menstruation, nutrition (cheese, chocolates, red wines etc), and psychophysical stress.

Forty-two patients between the ages of 13 and 48, who were subdivided into an earlier and later treatment group, were surgically treated for migraines caused by the factors mentioned above. In the first group of 15 female patients that was treated, the surgical technique consisted of subperichondral septum correction crushing and partial or total resection of the middle concha and ethmoidal opening. In four of the patients where no septum deviation was observed, a resection of the middle nasal concha and a transnasal opening of the ethmoidal cells in the area of the middle nasal passage was performed. In the later group consisting of 27 patients, the surgical technique was simplified so that only subperichondral septum correction and crushing of the middle concha was performed, without total resection of the concha and ethmoidal cell opening.

Up to the present all the 42 patients operated on have been free from migraine attacks, the first operation having been performed seven years ago and the last eight months ago.

INTRODUCTION

There are many theories which attempt to explain the pathophysiology of the origin of migraine, causing controversy in the field as new theories are brought to the foreground and the old ones discarded or modified.

Some of the earlier theories for the cause of migraine are based on the experiments of Claude Bernard and E. Dubois Raymond (1860) who state that angiospasm is responsible for causing migraines. Other authors, such as Hoffmann, regard the cause of migraines to be the dilation of basal cerebral arteries. Wolf explains migraines with vasodilatation and vasoconstriction of extracranial and cerebral vessels, while Heppner explains the migraine pains with hypoxia and cerebral anoxia (cited by Glavan, 1963). Heyck finds the cause of migraines to be

in disturbance of vasomotoric regulation and ischemia as a consequence of this disorder with inherited dispositions playing a major role here. Other authors find abnormal thrombocyte aggregation to be the cause of migraine (Hanington, 1979). Recently, serotonia (5-hydroxytryptamine) has been regarded as responsible for migrainous attacks (MacKenzie and Edvinsson, 1980; Sicuteri et al., 1965; Sicuteri et al., 1974). Food allergy is also blamed as possible cause for migrainous attacks through antibody reaction and the liberation of histamine and serotonin (Monro et al., 1980; Wilson et al., 1980). Speculation is also made concerning increased prolactin level as cause (Polleri et al., 1979). Sudden weather changes have long been known as a cause of migraines (Sulman, 1980; Wilkinson et al., 1979) Alcohol, cheese, coffee, tea, fever, lack of sleep, low estrogen levels can also initiate migraines (Polleri et al., 1979; Sulman, 1980).

Seven years ago, through a fortunate chance, I discovered the first stage (first trigger chain) in the pathogenesis of menstrual and foehn migraines, as well as the migraine originating from the other factors mentioned above.

The pathogenesis, or better expressed, the first trigger stage, is found in the region of the middle nasal passage, middle concha and the septum. Pathomorphological alterations in this area, such as septum deviation, large middle concha or restricted conditions in this area are responsible for the migraine attacks.

PATIENTS AND METHODS

Forty-two patients, suffering from migraines triggered by factors such as menstruation, weather changes, various foods, wines, psychophysical stresses, and so on, were assessed by a standardized diagnostic method initiated by the author for the operative indication, and were then operated on by a method which will be described later on. These patients were divided into an earlier treatment group consisting of 15 patients and a later group of 27 patients. There were 40 female patients (18–48 years old) and two male patients (13 and 37 years old).

The migraine diagnosis and therapy have been established by various neurologists and they were conservatively treated for years with various anti-migrainous preparations. The most used pharmaceutically active group of preparations was ergotamine tartrate combined with coffeine. All patients, except one, had hemicranial migrainous pains. All the patients have had typical migraine attacks with typical symtomatology. Almost all of them had had an optical, digestive of psychic aura a few hours before the attack.

The symptoms are described as queasiness, fatique, bad mood, decelerated reaction, increased irritability, nausea, premature feeling, micturition urge, and so forth. The headaches began with nausea, photophobia, various optical phenomena such as sparks, flames or rainbows. The most severe headaches were in the forehead area, retrobulbar, and in the parietotemporal area. Somewhat less severe pains were experienced occipitally. The pathological findings in the nose

corresponded in a migrainous attack with the side on which the headaches occured. I was able to determine pathological changes in all 42 patients with anterior rhinoscopy and also with optical rhinoscopy.

As proof that the middle concha, the middle nasal passage and the septum are triggering elements in this area during the migrainous attacks, I have developed a very simple and completely reliable test for the operative indication. The diagnostic confirmation is provided by insertion of several layers of wadding soaked with Twen Pantocaine-Privin® between the middle concha and septum and the middle concha and the middle nasal passage during the most severe pains. If the pains have decreased markedly after 30 minutes, or have practically disappeared, this is then an indication for a surgical operation. At times, in order to facilitate the insertion of the wadding, a five minute general decongestion of the nasal mucosa is performed prior to the insertion of the wadding. In my experience even with only 30 minute Twen Pantocaine-Privin® nasal insertion I was able to determine with 100% certainty that this pathological finding (septum deviation in region 3/4 of the major middle concha, or restricted conditions in this area) induce the migrainous attacks.

In the case of all 42 patients, an operative plan was made after the examination and the diagnostic confirmation with Twen Pantocaine-Privin® soaked wadding insertion. Various surgical operations were performed depending on the pathological findings. In the case of deviation of the septum at the level of the middle concha in the region 3/4, and otherwise in the case of other deviation of the septum, a subperichondral correction of the septum was performed (modified technique of Cottle). In the initial group of 15 patients, depending on the findings in addition to the above procedure, the middle concha was always either resected, or partially resected, crushed and medialized. Furthermore on opening of the ethmoidal cells, through the medial nasal passage, was performed on each patient. In the second group consisting of 27 patients only a subperichondral resection and crushing of the middle concha was performed since it was found to give the same results as in the earlier group. The surgical operations were performed under local or general anesthesia depending on the case.

Postoperatively, the nose was plugged with a solid-edge bandage soaked in Teracortril®. A smaller separate plug (to reduce adhesions) was introduced between the medial concha and the medial nasal passage. Each operated patient was protected with 3 million units daily of Phenoxypen (penicillin) as antibiotic. The plug was removed on the third day after the operation. After it had been removed, each patient received antiphlogistic, detumescent Dexa-Rhino Spray® and epithelializing Unathol® nasal salve. Where the septum correction had been made, the stitches were removed on the 8th to 10th day after operation.

RESULTS

In the first group of patients treated, 14 of the 15 operated patients have been definitively relieved from migraines. The first operation was performed seven years ago, and the postoperative period is between one and seven years. In one patient where migraines had persisted postoperatively, it was found that she still had a remmant of the middle concha which was subsequently crushed and partially resected with successful results.

In the more recent treatment group (27 patients), only a crushing of the middle concha and a subperichondral septum correction was performed, without total resection of the concha and ethmoidal cell opening. All patients were completely relieved from migraine attacks which were previously induced by various factors already mentioned. The postoperative migraine free period in this group is between six and twenty months.

DISCUSSION

As has been mentioned previously theories abound as to the cause of migraines. This work sheds some light on a possible mechanism for the cause of migraines. Through the Twen Pantocaine-Privin wadding insertion test and the subsequent successful operation in the region of the nose, it has been proven that the first stage in the triggering chain of a migraine is located in the nose. It is clearly shown that pathophysiological changes occur in the nose, such as for example, deviation of the septum in the region 3/4, large middle concha, or restricted conditions in the area of the region 3/4. It is probable that the nasal mucous membrane also has a pronounced propensity for swelling (formation of edemata). In normal situations, these morphological changes in the nose do not cause migraine attacks. Where weather changes occur suddenly (particularly in Switzerland), the physical parameters also change such as, atmospheric pressure, relative humidity, temperature, electrostatic charge (ionization), electromagnetic field, cosmic radiation and so forth. These physical alterations produce edemata in the nasal mucous membrane area. The hormonal changes before and during the menstrual period (progesterone-estrogen drop) produce premenstrual and menstrual formation of edemata also in the nasal mucous membrane area. Whereever previously existing pathomorphological alterations in the area of the middle concha, middle nasal passage as well as septum in this area are present, an additional edema leads contact, pressure and tension between the middle concha and septum or between middle concha and middle nasal passage.

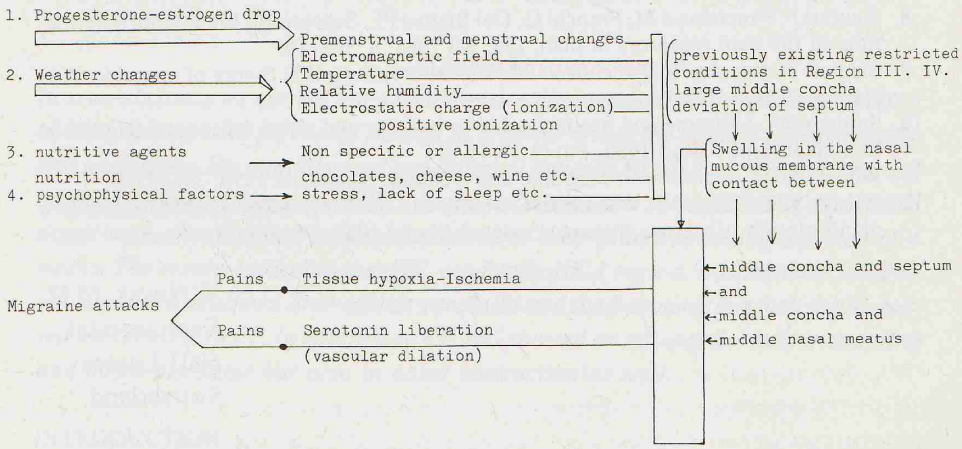
The nasal accessory sinus respirations are reduced. The contact pressure points, as well as the altered nasal accessory sinus respirations produce tissue hypoxia. Tissue hypoxia leads directly to migrainous pains. As a results of pressure and hypoxia, serotonin is freely released from the tissue. This additional release of serotonin produce dilation of the cerebral arteries. And the migrainous pains

arise from these mechanism (MacKenzie and Edvinsson, 1980; Sicuteri et al., 1965; Sicuteri et al., 1974).

Where weather changes occur, just the electrical charge (for example, positive charge) can trigger a release of serotonin from the tissue which leads to edema formation (Sulman, 1980; Wilkinson and Woodrow, 1979) (Table 1).

It becomes evident from this work that migraines are not a syndrome, but rather a pain symptom. There are certainly various other pathophysiological mechanisms which release other types of migrainous pains.

Table 1. Origin of menstrual and weather (foehn) migraines.



ZUSAMMENFASSUNG

Durch diese Arbeit wurde das erste Mal festgestellt, dass der pathologische Hintergrund für verschiedene Migränenarten in der Nase liegt. Es wurde erfolgreich über die definitive, chirurgische Versorgung bei Wetter-(Föhn) Migränen, Menstruationsmigränen, sowie Nutritions- und Stressmigränen berichtet. Zweiundvierzig Patienten zwischen 13 und 48 Jahren wurden aufgeteilt in zwei Gruppen.

In der ersten Gruppe von 15 Patientinnen wurde subperichondral Septumkorrektur, Quetschung und partielle oder totale Resektion der mittleren Muschel und transnasale Eröffnung des Ethmoides durchgeführt.

Bei vier Patienten ohne Septumdeviation wurde Resektion der mittleren Muschel sowie Eröffnung des Ethmoid durchgeführt.

In der zweiten Gruppe von 27 Patienten wurde die chirurgische Technik vereinfacht, und es wurde nur subperichondrale Septumkorrektur und Quetschung der mittleren Muschel durchgeführt. Nach der Operation sind alle Patientinnen Migränenfrei. Die erste Operation wurde vor 7 Jahren, die letzte vor 8 Monaten durchgeführt.

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