Temporomandibular dysfunction can contribute to aggravation of tension-type headache: a case report

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ABSTRACT
A 15-year-old girl, who had had occasional tension-type headache, developed, rather suddenly and without any obvious reason, severe headache. She was admitted to hospital, where examination including CT and magnetic resonance scans did not show any abnormality. A visit to her own general practitioner 7 months later showed tenderness in the muscle of mastication. The patient was referred to a dentist, who diagnosed temporomandibular dysfunction and tension-type headache. After three acupuncture treatments, the patient was without headache and remained free of headache during the following 6 months.

THE CASE
A 15-year-old girl had had for 3–4 years an intermittent tension-type headache, which usually disappeared without any treatment. In the summer of 2006 she had a head trauma while diving in shallow water. After this the nature of the headache changed, but it still responded to paracetamol.

During autumn 2007, the headaches suddenly, without any obvious cause, worsened and the patient consulted her general practitioner. The headache was now constantly, with a severity of 5–7 on a visual analogue scale (VAS), and localised as a band around the head. There was no phonophobia or photophobia, and no nausea. On examination, tense muscles were found in the neck and shoulder girdle, but no other abnormalities.

Because of the sudden deterioration of her headache, the patient was admitted to hospital for 24 h. Neurological examination, blood tests, CT and MRI of the cerebrum and cervical spine showed no abnormalities. Psychiatric examination was normal and she was diagnosed as having tension-type headache.

The patient was referred to the Danish Centre for headache and treated with riboflavin and physiotherapy of the neck and shoulder muscles. Because of her stressful life, she was also referred to the stress management centre. She lives in a large family with many problems, because two of 10 children in the family have severe Tourette’s disease. The patient is number nine of 10 children.

This exacerbation of headache had now lasted for 7 months. The patient attended ordinary school, but was often ill for long periods, due to pain and lack of concentration. Before the headaches she was doing very well at school and was very active in sport. The diagnosis tension-type headache was confirmed by the two centres.

Because of her constant headaches, the patient visited her general practitioner again, who identified tenderness of the muscle of mastication as well as tension of the neck muscles, and the patient was referred to a dentist with a tentative diagnosis of temporomandibular joint disorders (TMD).

When the dentist examined her, he found two non-working-side-interferences (NWSI) on 16 and 27, which disturb the smooth contact of the canines. Moreover, a hyperocclusion on 36 was found, probably caused by an amalgam filling that was too tall. On examination, the dentist noticed tenderness in the muscle of mastication, the trapezius muscle, the splenius capitis muscle and the levator scapulae muscle. He also noted deviation of the jaw. The intensity of the pain was 8–9 on a VAS and the patient was diagnosed as having tension-type headache and TMD.

The dentist treated her with acupuncture at points ST7 and ST71/2, situated around the temporomandibular joint. The amalgam filling and the NWSI was corrected.

Because of sore muscles in the neck and shoulder, acupuncture was given in the points GB20 and GB21, located on the neck. The needles were inserted at the appropriate points and depth (details were not recorded). After achieving de qi sensation, the needles were rotated clockwise and anti-clockwise for a few seconds and left in situ for 5 min without any further stimulation. Finally, acupuncture using the same technique was given in GV20 and EX6, located on the top of the head, for their relaxing effect.

An improvement was noticed after 24 h, but not at the next visit a week later. Another treatment, with the same point combination was given. Because of frontal headache the point GB14, located on the forehead, was added.

At the third visit, the pain was reduced to 2–3 on a VAS and the band around the head had disappeared; however, the neck muscles were still slightly tender, and the patient received a final treatment at the points GB20, GB21 and SI16. The tenderness of the muscles of mastication had disappeared. No further treatment was given, and 6 months later the patient has only had an occasional headache, which responds to paracetamol.

DISCUSSION
Headache is a major problem, affecting an estimated 78% of the general population. Of those, 3% have chronic headache. There are several causes of headache, but tension-type headache and migraine are the most common.

The normal treatment of tension-type headache is simple analgesics, non-steroidal anti-inflammatory drugs, antidepressant agents, anti-epileptic drugs, antihypertensive agents, physiotherapy, chiropractic treatment and acupuncture. However, some patients do not respond to this treatment, and an often-overlooked cause of headache is TMD, either alone or in combination with neck problems.

The patient had a 3–4 year history of mild tension-type headache. Because of acute deterioration in autumn 2007, the patient was properly investigated. Despite various treatments, the patient still had constant headache. TMD was suspected and the
patient was referred to a dentist, who confirmed the diagnosis. After three acupuncture treatments at the dentist, the patient became symptom-free and experienced no flare up during the following 6 months.

The reason for the time lapse from the initial trauma to the development of the constant headache is not obvious. However, the dentist concluded that the patient might have had a dislocation of the temporomandibular joint, caused by the trauma. This dislocation had caused active trigger points in the temporalis and lateral pterygoid muscles. It is generally accepted that trigger points cause shortening of the muscles involved\(^5,6\) and that this afterwards can cause hyperocclusion and NWSI.

There are many definitions of TMD, but one of the most widely used is the definition by Gray \(et\ al\)\(^7\), which divides TMD into (1) pain dysfunction syndrome (PDS); (2) arthrosis; and (3) malformation. Among the three possibilities, PDS is far the most common. To fulfil the criteria for PDS, patients must have at least three of the following: (1) pain on palpation of the temporomandibular joint; (2) pain on palpation of the muscles of mastication; (3) deviation of the jaw when opening the mouth; (4) click; (5) headache. The patient thus fulfilled three criteria.

Within a 2 week period, the patient received three acupuncture treatments from the dentist and had a few minor adjustments of the bite function. Of course one might consider that the effect was due to the bite adjustments only, but this is unlikely, as the effect of the initial adjustment of the bite lasted for only a few days.

A meta-analysis, based on several randomised controlled trials, concludes that acupuncture is effective in treatment of PDS, without adjustment of the bite function.\(^8\) In this particular case a bite adjustment was made to prevent a flare up.

The cause of the problem here was probably a shortening of the lateral pterygoid muscle, which was relaxed by the acupuncture treatment, thus restoring its natural length and causing a neutral bite. The reason that the initial response was only temporary is probably because of persistent shortening of the muscles. Since the following two treatments, in which acupuncture was given alone, apparently solved the problem, it is likely that the effect was due to the acupuncture treatment.

CONCLUSION
Chronic headache is a common health problem, and acupuncture can be used diagnostically. However, a careful physical examination is recommended, including palpation of the muscle of mastication in patients with persistent tension-type headache. In unexplained causes of headache a dental examination should be carried out.

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