

The posterior deep temporal artery

A artéria temporal profunda posterior

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ABSTRACT

Introduction: The posterior deep temporal artery is a branch of the maxillary artery from which emerges near the origin of the middle meningeal artery. The role of the maxillary artery has never been discussed in migraine, and yet it gives origin to the two most important arteries responsible for the pain during a migraine attack. **Objective:** The objective of this paper is to show that, contrariwise to what has always been thought, it is not the superficial temporal artery that is responsible for the pain in the temple during a migraine attack, but the posterior deep temporal artery. **Methods:** A hundred diaries from different patients, each containing the locations of pain during attacks in one whole year, were analyzed. **Results:** Out of 8,178 locations obtained from the diaries 28.0% were on the temples, more on the left than on the right. Out of the 100 patients 24 underwent a subcutaneous infiltration in the temporal region after the posterior deep temporal artery was localized by means of a Doppler, with absolute success in 12 patients and partial success in five. **Conclusions:** The posterior deep temporal artery, which is superficial in the temple before it penetrates the temporal muscle, has always been neglected, and yet it is the artery patients point to during a migraine attack, and not to the superficial temporal artery.

Key words: Migraine; superficial temporal artery; posterior deep temporal artery.

RESUMO

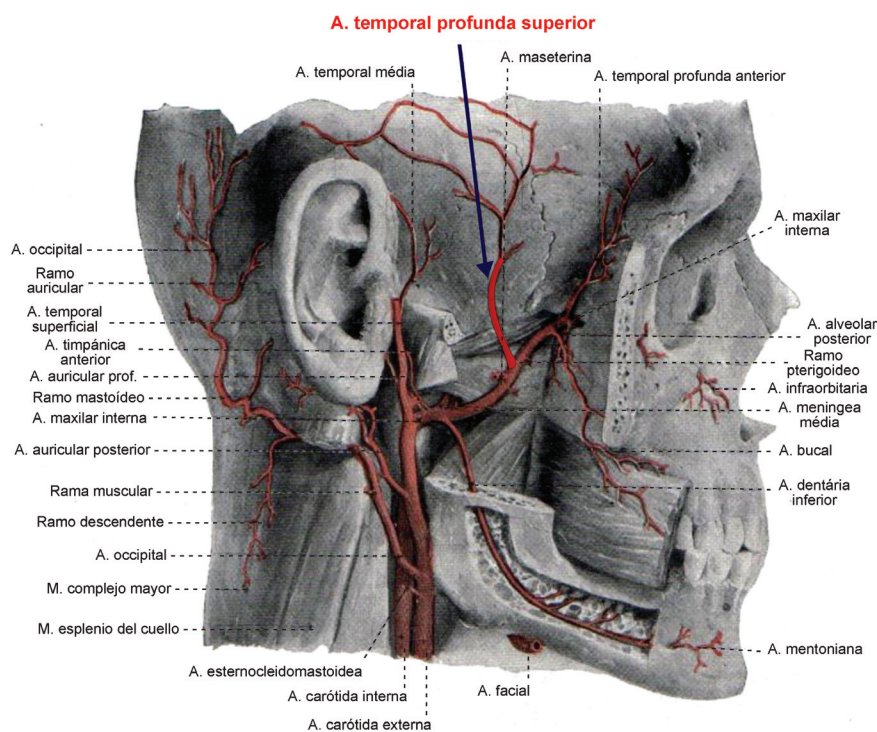
Introdução: A artéria temporal profunda posterior é um ramo da artéria maxilar da qual emerge próximo à origem da artéria meníngea média. O papel da artéria maxilar nunca foi discutido na migrânea, e ainda origina as duas mais importantes artérias responsáveis pela dor durante as crises migranosas. **Objetivo:** O objetivo deste trabalho é mostrar

que, ao contrário do que se pensou, não é a artéria temporal superficial que é responsável pela dor nas têmporas durante uma crise migranosa, mas a artéria temporal profunda posterior. **Métodos:** Durante 12 meses foram analisados cem diários de diferentes pacientes, cada um contendo as localizações da dor durante as crises. **Resultados:** Das 8.178 localizações obtidas dos diários, 28,0% foram nas têmporas, mais à esquerda do que à direita. Dos 100 pacientes 24 submeteram-se a uma infiltração subcutânea na região temporal após a artéria temporal profunda posterior ter sido localizada através do Doppler, com sucesso absoluto em 12 pacientes e sucesso parcial em cinco. **Conclusões:** A artéria temporal profunda posterior, que é superficial nas têmporas antes de penetrar o músculo temporal, sempre foi desprezada; no entanto é a artéria que pulsa numa crise migranosa, ao invés da artéria temporal superficial.

Palavras-chave: Migrânea; artéria temporal superficial; artéria temporal profunda posterior.

INTRODUCTION

Ever since Wolff in his book¹ emphasized that the artery responsible for the pain in the temporal region in an attack of migraine is the superficial temporal artery (STA), it became a dogma that the temporal pain is equal to STA pain. Many papers have been written about this subject, but only one, by Drummond and Lance² comes to the conclusion that "dilatation of the superficial temporal artery and its branches contributes substantially to migraine headache in only a minority of patients".



Yet, when the patient complains of pain in the temporal region and you ask him or her to place the tip of the forefinger on the place where they feel the pain, they point to a region which corresponds to the anterior segment of the temporal bone, midway between the eye and the ear - and this is not the place where you expect to find the STA. On the contrary, it corresponds exactly to the location of the posterior deep temporal artery (PDTA). This artery, adjacent to the middle meningeal artery, follows a straight course upwards to irrigate the temporal muscle (Figure 1). On the other hand, pictures showing patients during an attack always have the patients placing their hands on the anterior part of the temporal bone and not next to the

ear, as would be expected if the pain were on the STA.

PATIENTS AND METHODS

In order to assess where the pain of an attacks is felt we give our patients a diary which has one page containing the drawings of four heads with numbered divisions (Figure 2) for the patient to write down in the partition "location of the pain" (in another page) the number or numbers corresponding to the places where the pain is felt. The numbered divisions correspond approximately to the nerves and arteries of the scalp that cause pain.

We selected 100 diaries for this study. The selection criteria were the occurrence of very frequent attacks and presence of pain in more than

two regions of the head in each attack. Our diaries have 12 pages, enough for one year, and we summed the numbers corresponding to locations of each pain in one year in each one of the 100 diaries.

The numbers that comprise the location of both PDTAs are six for the left and 16 for the right.

RESULTS

We obtained a total of 8,178 numbers in one year in the 100 diaries, out of which 1,322 were on division 6 (left) and 984 were on division 16 (right). This gives a total of 28.0% of the attacks being felt on the two PDTA

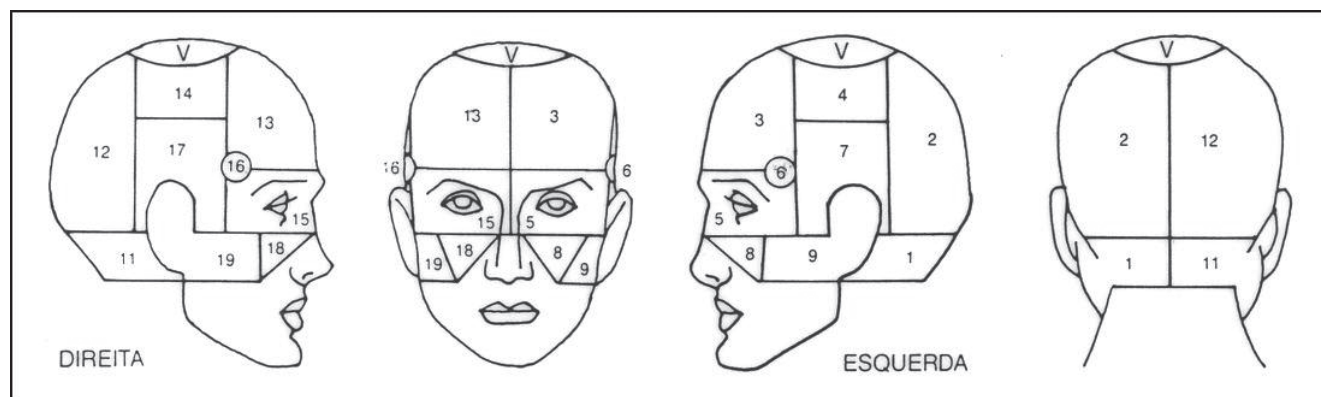


Figure 2

projections, in spite of the fact there are 20 possible numbered locations.

Out of the 100 patients 24 underwent an infiltration on the temporal region after PDTA was localized by means of a Doppler. The infiltration was done with 0.5 ml lidocain and 0.5 ml methylprednisolone acetate injected subcutaneously near the artery.

Of the 24 patients 12 were free of the temporal pain in a follow-up of one to two years, and only four required more than one infiltration. Five patients improved considerably but went on having mild temporal points even after three infiltrations. Seven patients did not benefit from the infiltrations.

It is important to say that the PDTA is rather superficial in the temporal region. It becomes deep when it penetrates the temporal muscle.

CONCLUSIONS

In favour of STA involvement there are Wolff's book¹ and many other papers from authors who studied changes in STA pulse amplitude,³ an antagonist of CGRP on the dilation of the STA,⁴ the effect of nitric oxide on histamine induced headache,⁵ effects of 5HT and ergotamine on the STA,⁶ study of the diameter of the STA during and attack,⁷ and the site of pain origin during migraine attacks.⁸

All these papers, and others, refer only to the STA. This is the first time in the literature that pain in the temporal region during a migraine attack is attributed to the PDTA and not to the STA.

In favour of this assertive we can state the following:

1) Pay attention to where the patient places his/her hand during an attack.

2) If you ask the patient to pinpoint the place where the pain is more intense they put the tip of the forefinger midway between the eye and the ear and not on the STA.

3) When there is a visible pulsation on the temporal region in an attack, this pulsation is seen on the projection of the PDTA.

4) Even when there is not a visible pulsation in an attack, the palpation of the temporal region elicits pain on the PDTA.

5) Lidocain subcutaneous infiltration on PDTA brings about pain cessation in the majority of cases.

It is important to emphasize that the maxillary artery deserves further studies, because from it arise both the

middle meningeal artery and the PDTA – and these two arteries play a significant role in migraine.

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