IN THE NAME OF GOD

ROLE OF CERVICAL MANIPULATION IN TREATMENT OF CERVICOGENIC HEADACHE

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Cervicogenic Headache

- *Cervicogenic headache (CEH) is a secondary headache characterized by unilateral headache and symptoms and signs of neck involvement .*
- *It is often worsened by neck movement, sustained awkward head position or external pressure over the upper cervical or occipital region on the symptomatic side*
- *The pathogenesis of CEH may originate from various anatomic structures in the cervical spine.*
- *Convergence of afferents of the trigeminal and upper three cervical spinal nerves onto the second-order neurons in the trigeminocervical nucleus in the upper cervical spinal cord is likely to lead to the headache*

Cervicogenic Headache

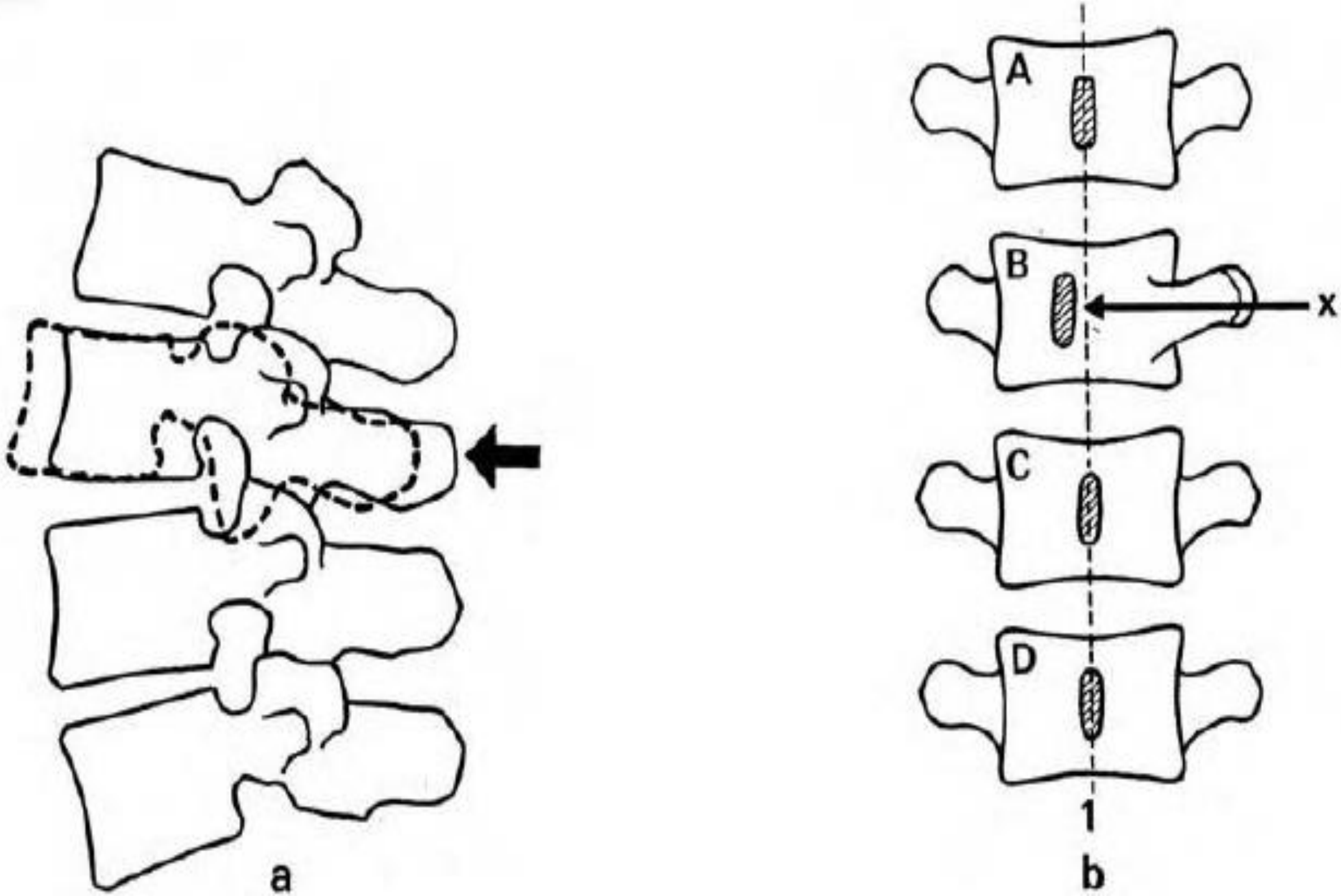
- *Because the diagnosis of CGH is relatively new, its particular etiology remains unclear.*
- *Sjasstad and his colleagues suggested that CGH is a "final common pathway" for pain generating disorders of the neck. Bogduk has proposed that the pathophysiology of CGH results from a convergence of sensory input from the upper cervical spine into the trigeminal spinal nucleus, including input from:*
- *Upper cervical facets*
- *Upper cervical muscles*
- *C2-3 intervertebral disc*
- *Vertebral and internal carotid arteries*
- *Dura mater of the upper spinal cord*
- *Posterior cranial fossa*

Cervicogenic Headache

- *the only spinal sign showing the cervical origin of a headache is tenderness to palpation of the C2–3 facet joint on the affected side.*
- *pressure maintained on the facet joint point can reproduce the usual referral pattern*
- *in most cases, radiographic studies of the superior cervical spine are normal.*
- *In a patient having repeated attacks, facet joint (C2–3) palpation is tender ipsilateral to the headache and is found even between acute attacks.*
- *In general, it is the result of a PMID. Occasionally, it can be due to synovitis*

SEGMENTAL EXAMINATION

- *FOUR BASIC MANEUVERS OF THE SEGMENTAL EXAMINATION ARE AS FOLLOWS :*
- *1.POSTEROANTERIOR PRESSURE OVER THE SPINOUS PROCESS*
- *TRANSVERSE PRESSURE AGAINST THE LATERAL ASPECT OF TRANSVERSE PROCESS*
- *LONGITUDINAL FRICTION OVERLYING THE FACET JOINT*
- *PRESSURE AGAINST THE INTERSPINOUS LIG*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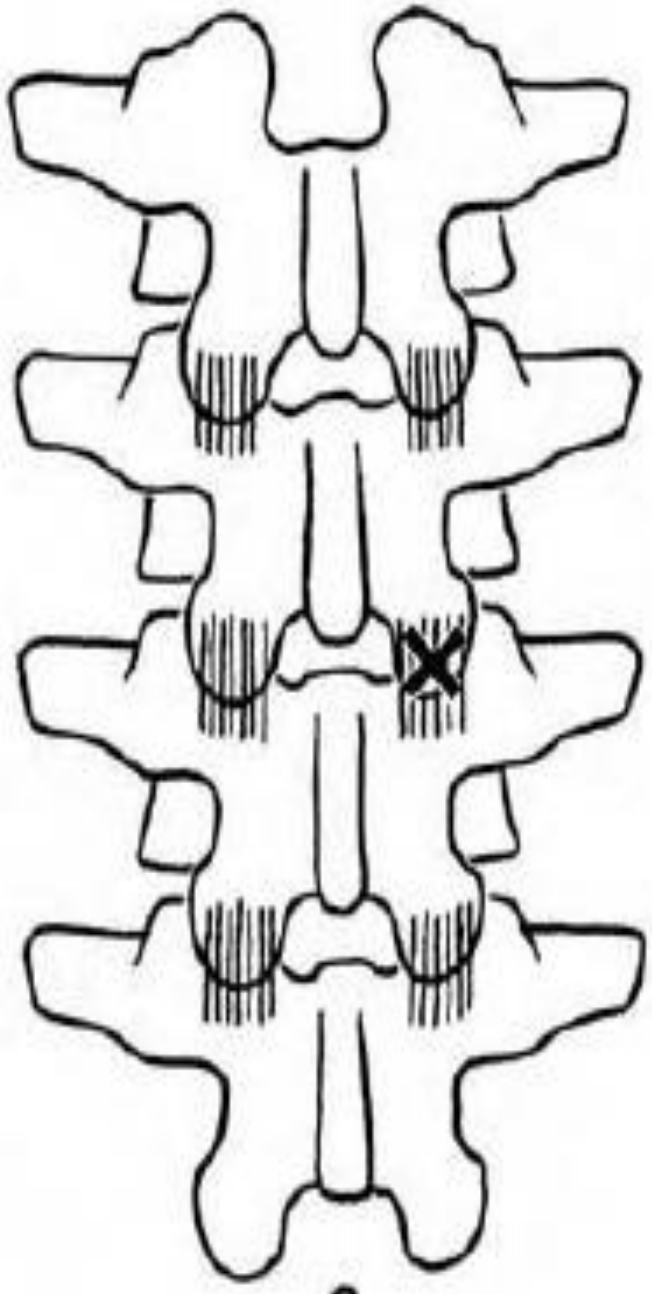

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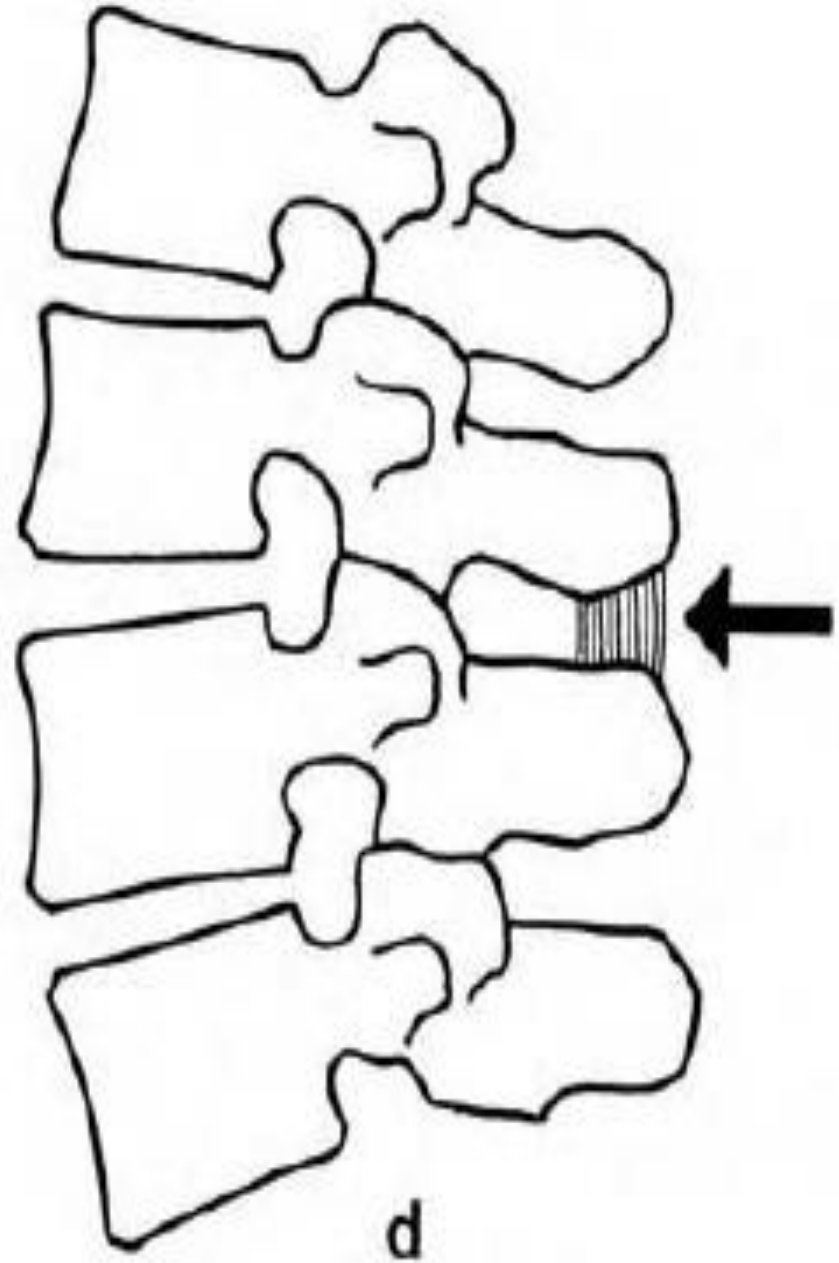

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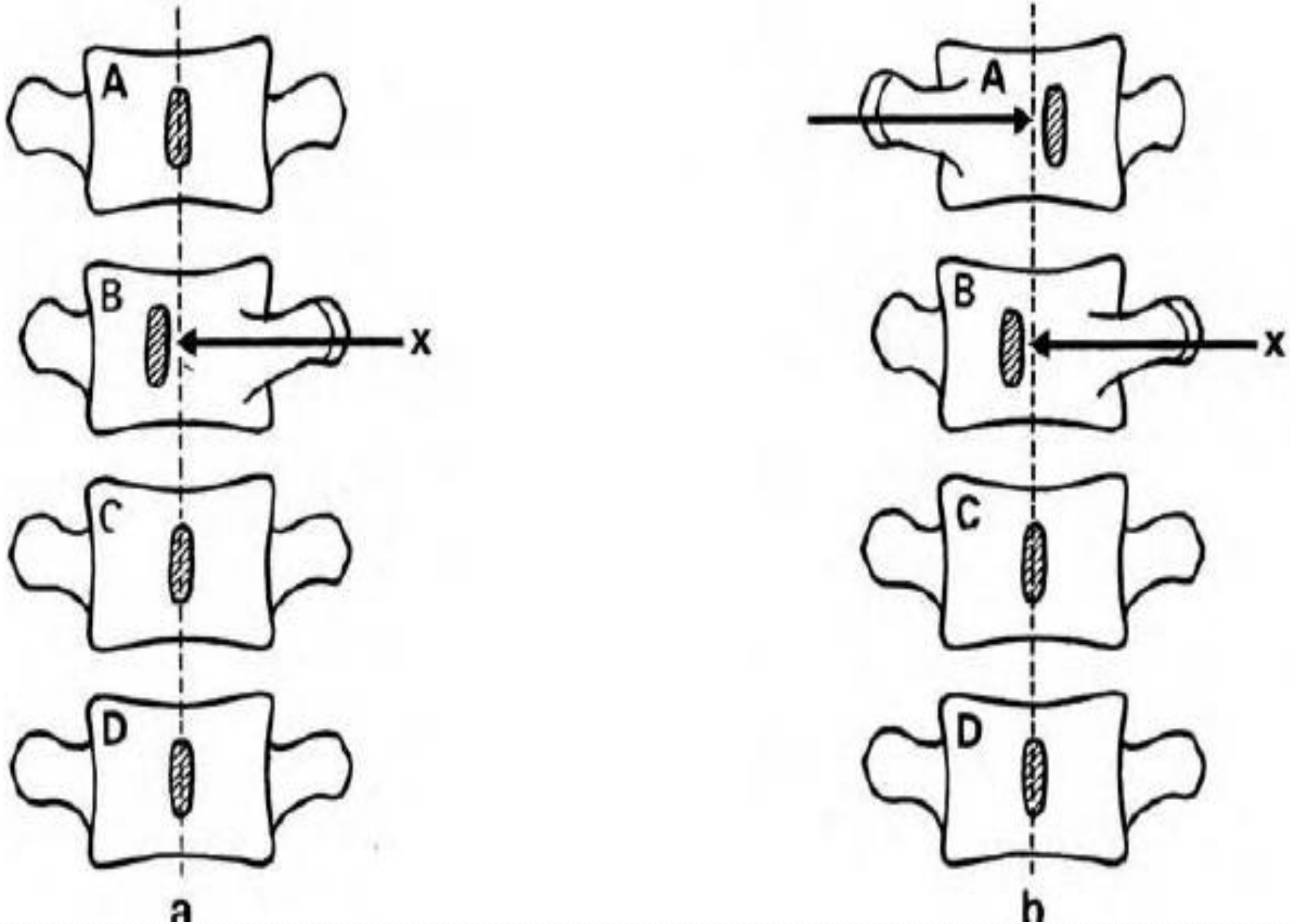
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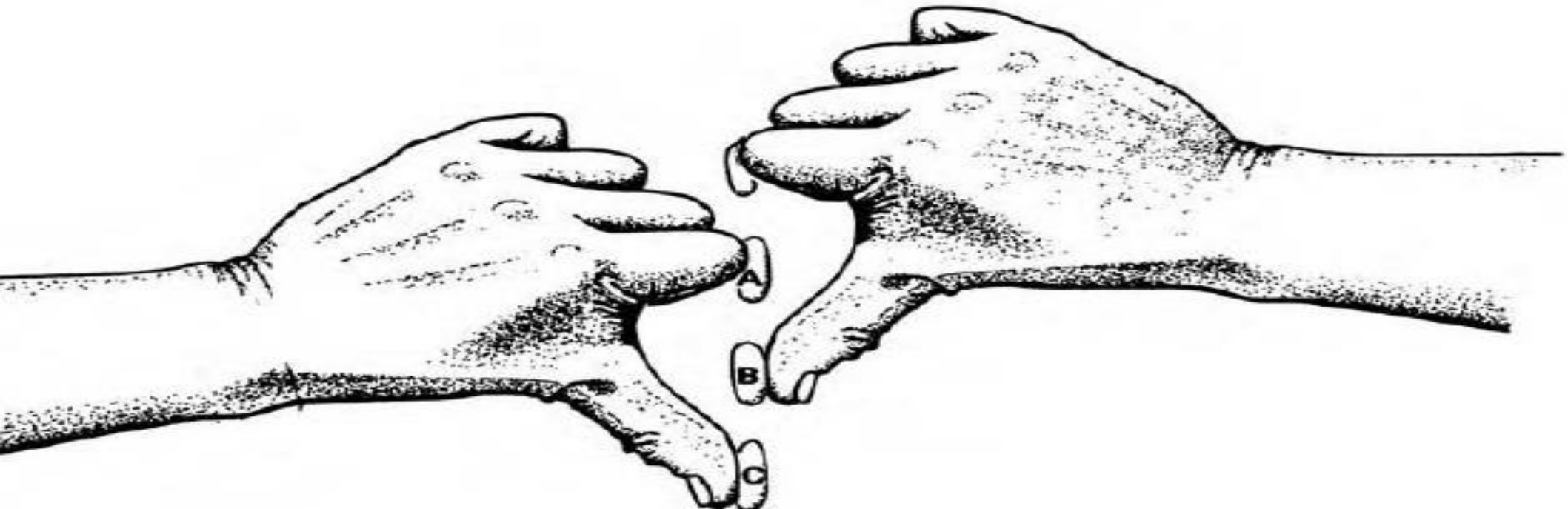
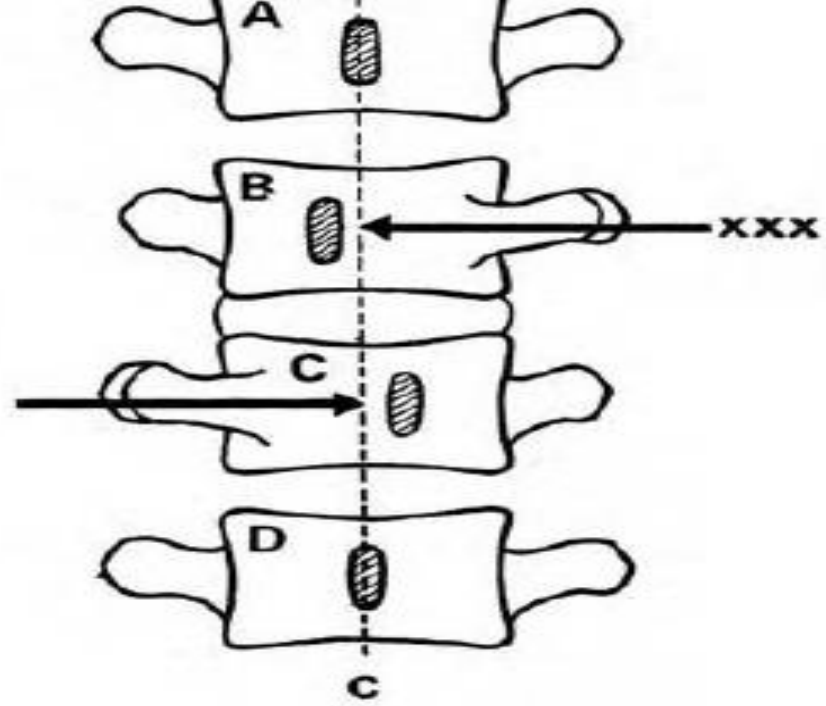
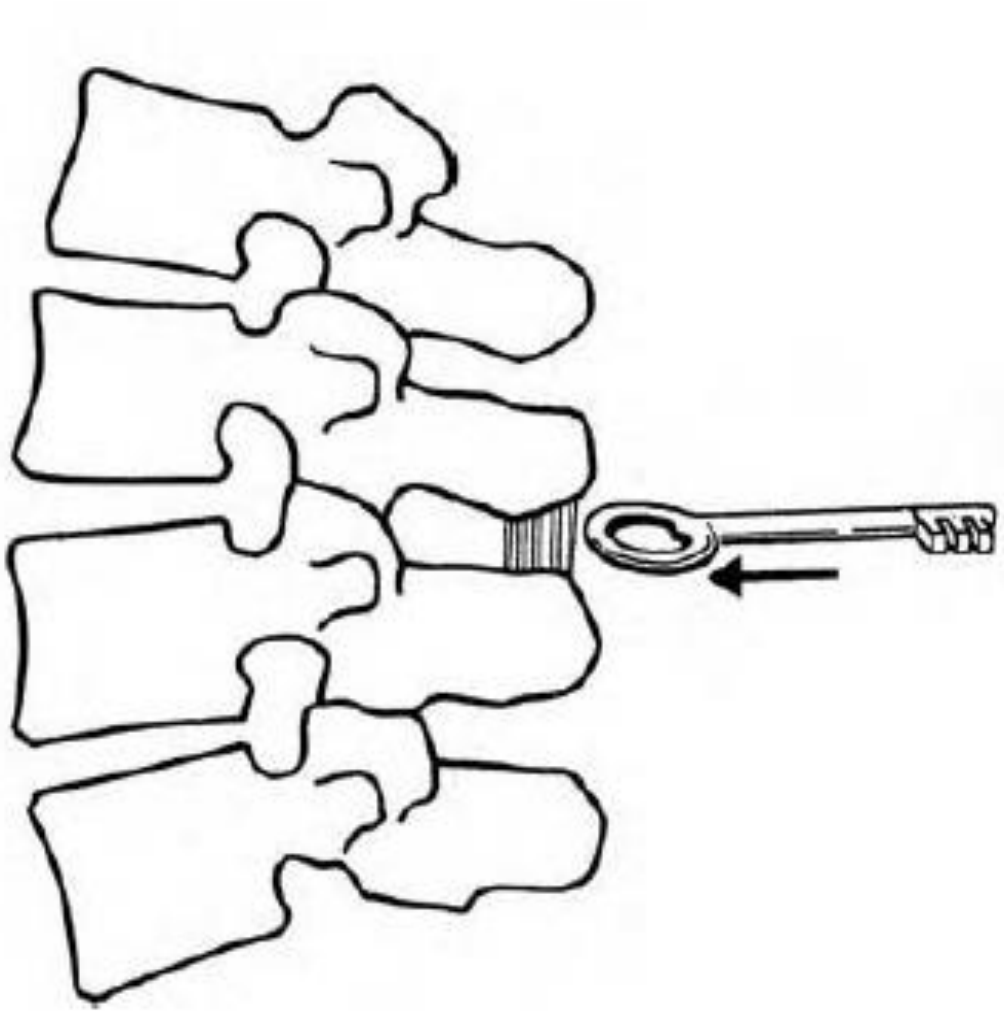
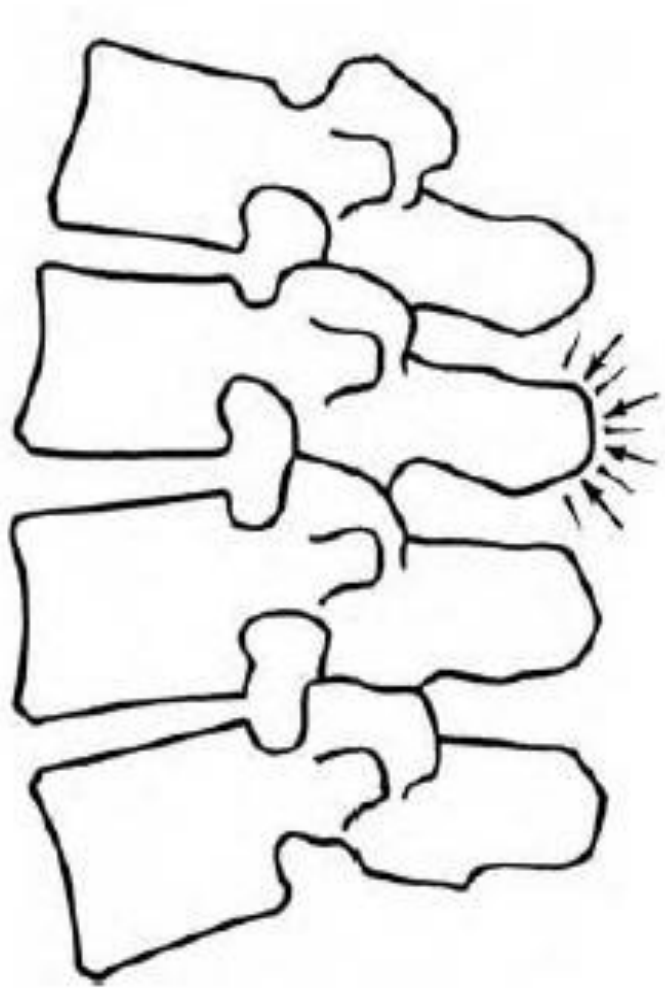
stricted transverse pressure. To make the prior exami-
sitive, one can use lateral counterpressure simulta-
. **a.** For example, one can produce tenderness to
nt to left on B, indicated by **x**. One would like to know
is due to involvement of segment AB or segment BC.
ng pressure on B from right to left, one simultaneously
rpressure on A. This maneuver did not increase the
By contrast, the same maneuver executed on C notably
n provoked by the isolated pressure on B (indicated
gment BC is identified as the cause of the pain.

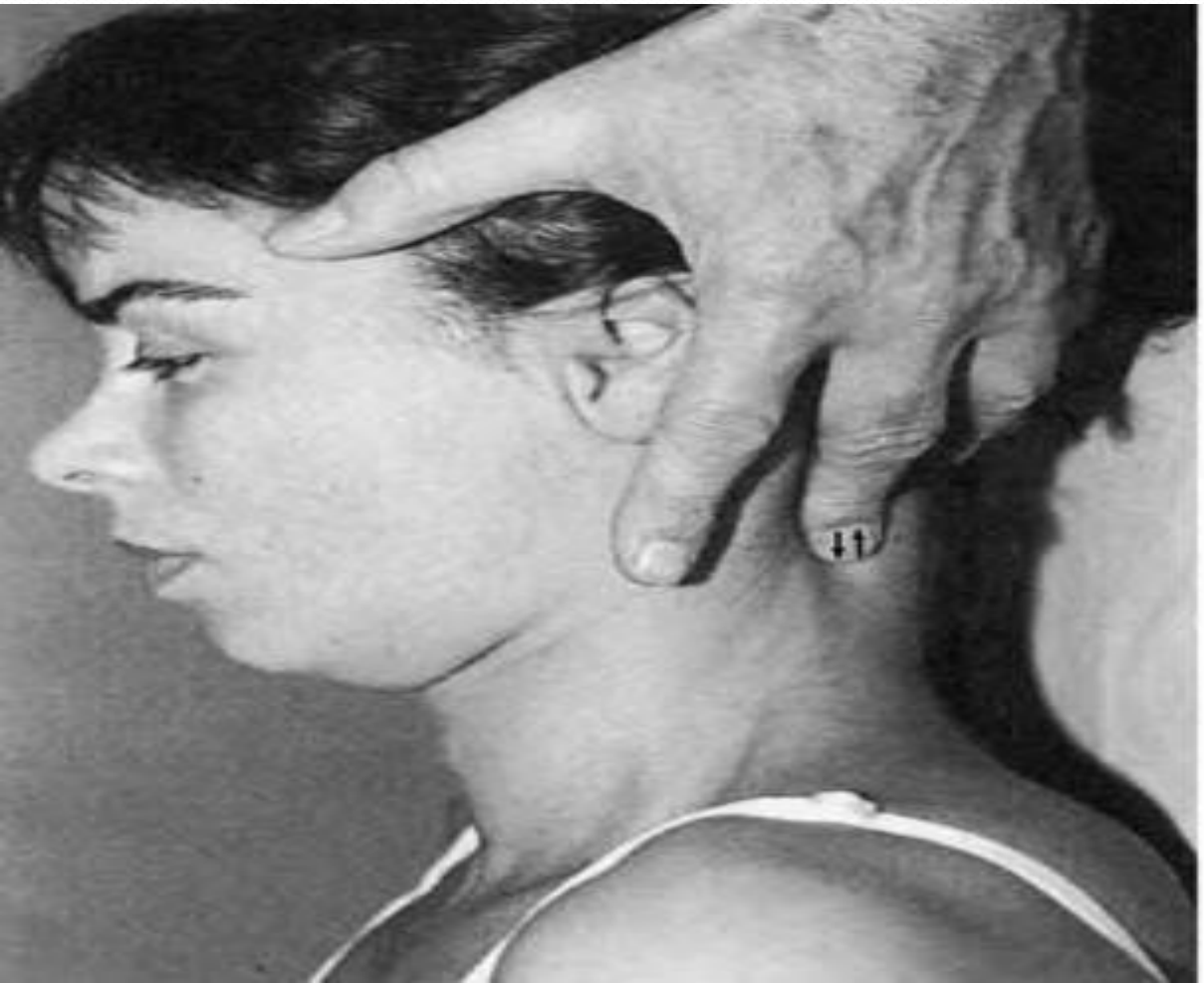


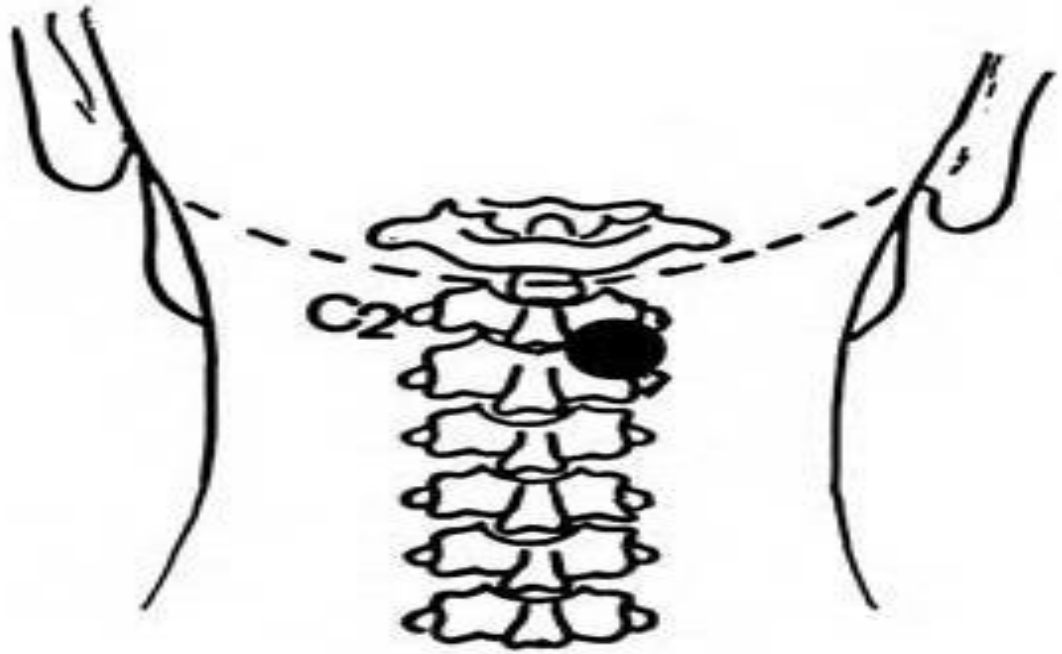






Cervicogenic Headache

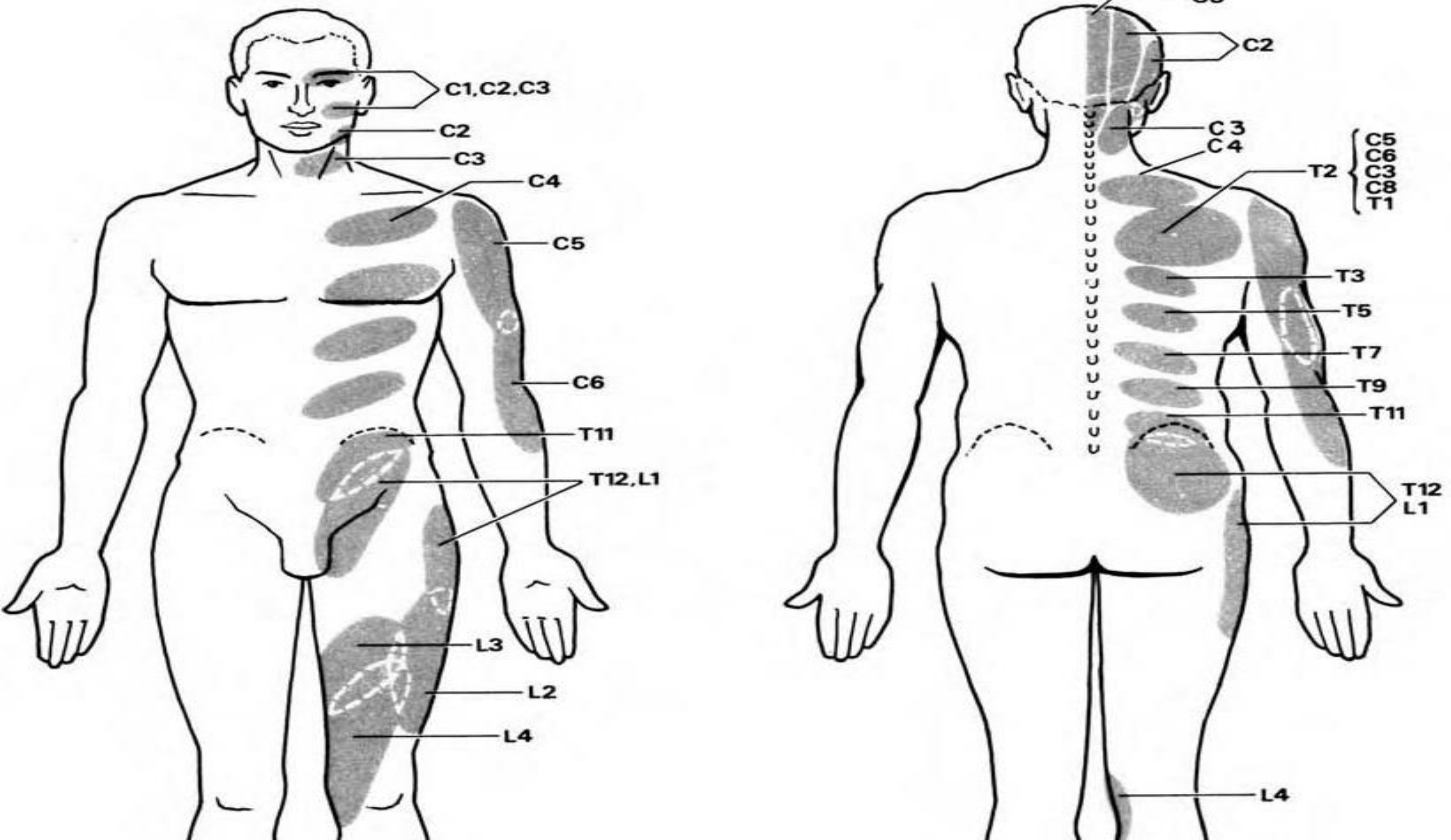




CELLULOTENOPERIOSTOMYALGIC SYNDROME

- *Under the title of "segmental vertebral cellulotenoperiosteomyalgic syndrome" (SVCPMS), we describe a group of palpable modifications of the texture and sensitivity*
- *of the soft tissues ; cutaneous (cellulalgia)*
- *Muscular taut bands, with or without trigger points*
- *and tenoperiosteal (in relation to a segmental spinal dysfunction).*
- *These manifestations are localized to a constant territory*

  for a given spinal segment.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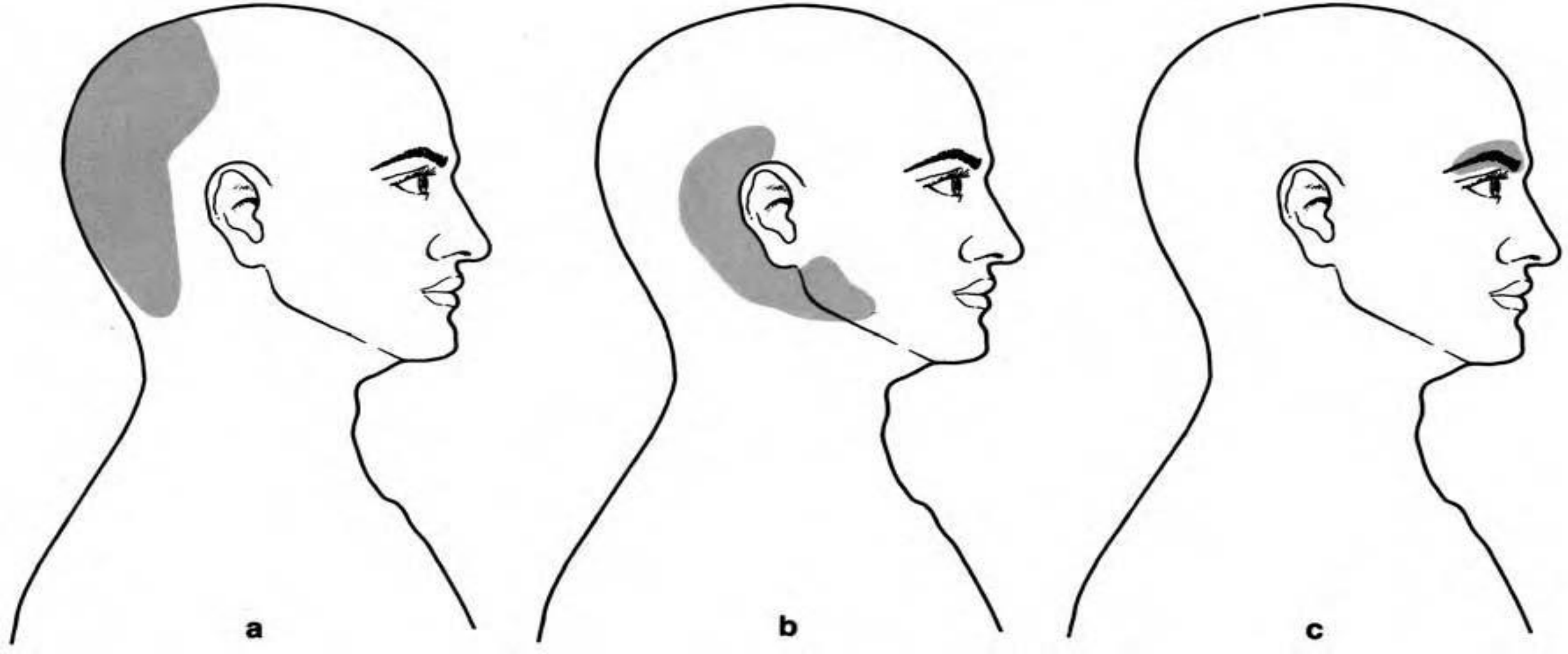
Cervicogenic Headache

- *Three forms of cervical headaches can be distinguished, each with its own semiology.*
- *1. Occipital*
- *2. Occipitotemporomaxillary*
- *3. Supraorbital:*
- *the most frequent, which corresponds to a projection of the cervical pain in the territory of the ophthalmic division of the trigeminal nerve*

Cervicogenic Headache

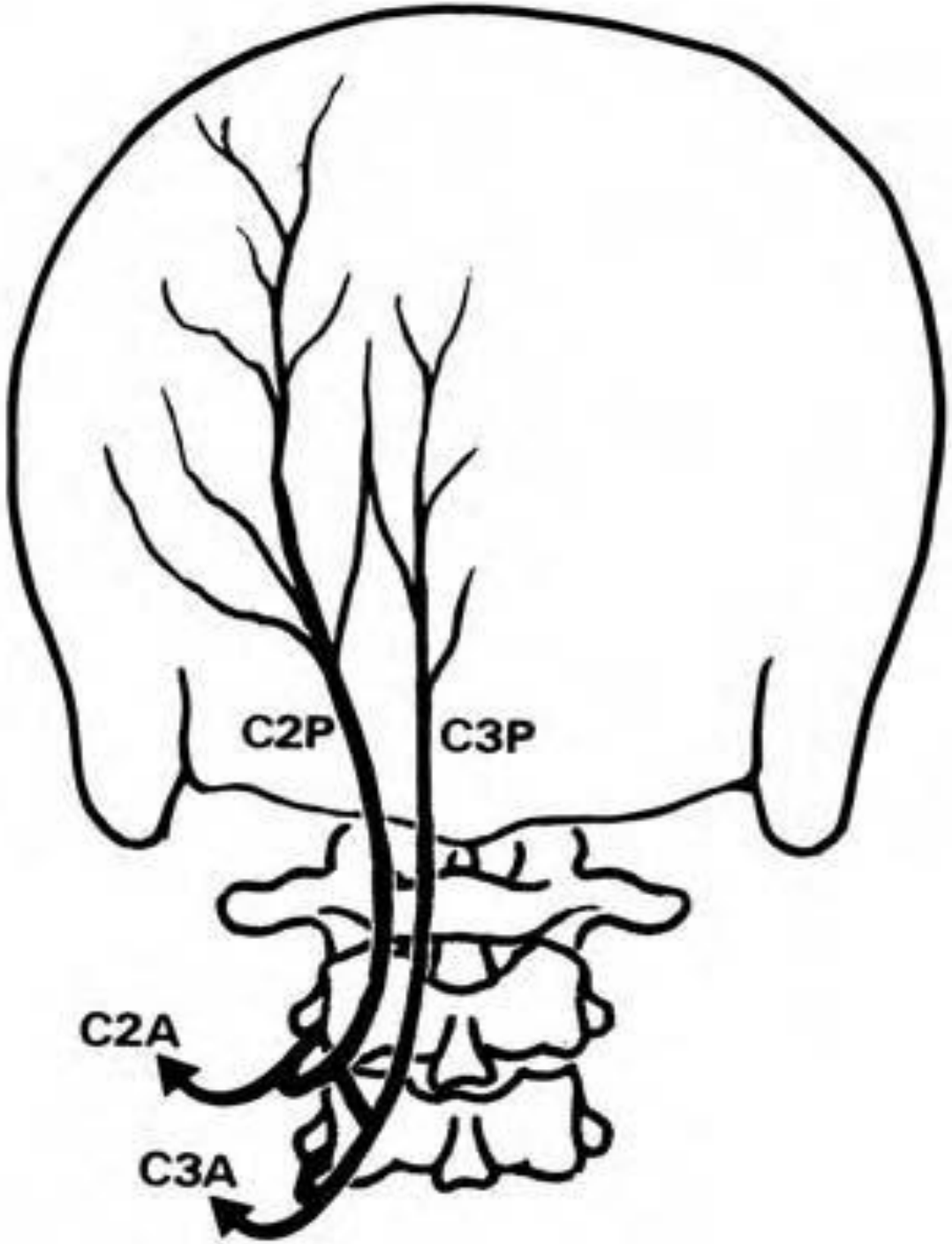


Occipital Headache

- *Occipital headache is felt at the occiput and can radiate to the vertex. It corresponds to the territories of the posterior rami of C2 and C3 Isolated, it represents 20% of headaches of cervical origin, but it is often associated with other forms.*
- *The acute form is Arnold's neuralgia; it is rare and its paroxysms are generally provoked by forceful or strenuous movements of the neck.*
- *The chronic form is frequent. It is responsible for episodic occipital headaches of variable duration and intensity.*
- *In both cases, the "friction sign of the scalp" (Maigne) can be found*

Friction Sign of the Scalp (Maigne)

- *Friction applied to the scalp replaces the pinch-roll test. It consists of pressing firmly with the pad of the fingers against the scalp and mobilizing it with small to-and-fro motions .*
- *This maneuver is painless on a normal scalp, but it is very disagreeable and even painful in the case of an occipital headache of cervical origin. Ipsilateral to the C2–3 facet joint, tenderness is found*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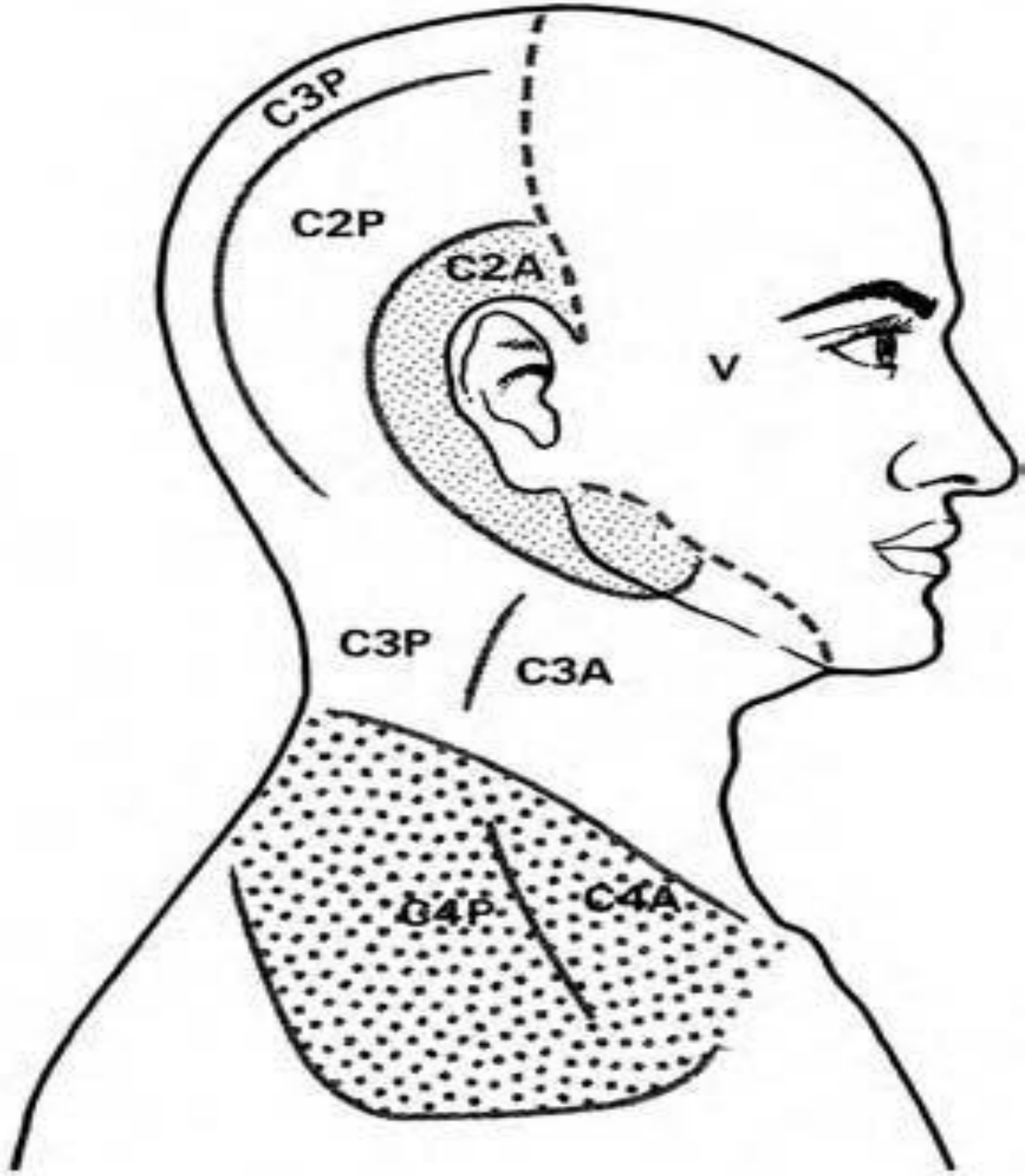
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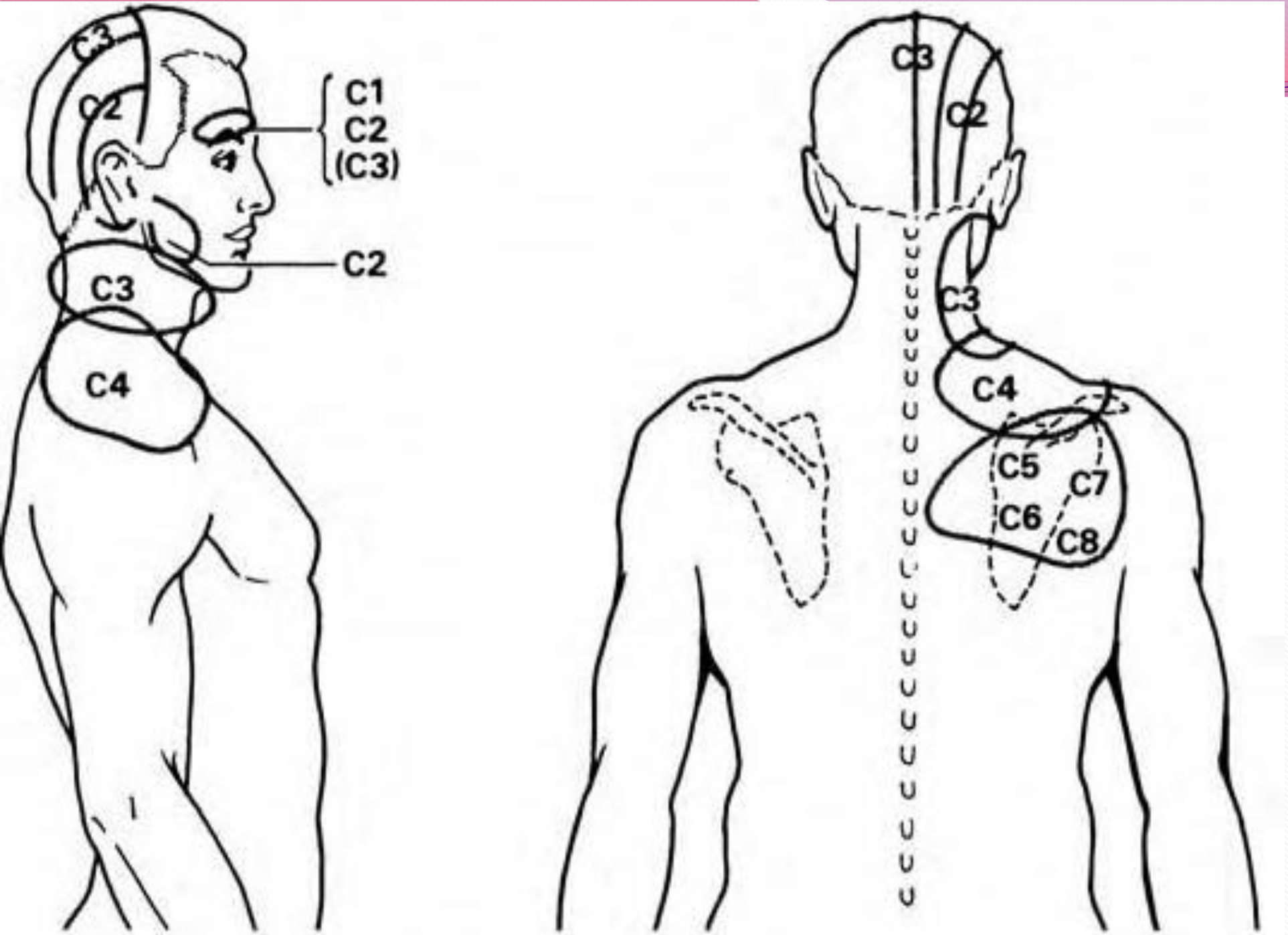
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Occipitotemporomaxillary Headache

- *The occipitotemporomaxillary headache is located in the retroauricular, mastoid, and parietal region and radiates toward the inferior maxilla. Pain is found ipsilateral to the facet joint tenderness at C2–3, with a positive friction sign over the painful scalp in the retroauricular territory that is innervated by branches arising from the superficial cervical plexus (anterior ramus of C2, sometimes of C3)*

Occipitotemporomaxillary Headache

- *Pain with pinch-rolling at the angle of the jaw is seen.*
- *A fold of the skin is pinched firmly between*

  the thumb and index finger and rolled between these two fingers.

The maneuver should be controlled and be compared with the opposite side. It requires practice, as do all the maneuvers that we propose here.

The sign is positive if the maneuver is painful (the fold can be thickened). It is painless on the contralateral side if the impairment is unilateral.

Occipitotemporomaxillary Headache

- *The discomfort elicited at the angle of the jaw is*

  referred to as "the angle of the jaw sign" (Maigne).

  This skin region at the angle of the jaw is innervated by the anterior ramus of C2 and not by the trigeminal nerve.

- *Isolated, this form comprises about 5% of headaches of cervical origin, but it is often associated with another form of headache, presenting with mild features.*

Cheek Sign (Maigne)

- *Some patients with the eyebrow sign also have some tenderness to pinch-rolling the skin of the cheek, located below the maxilla (cheek sign).*

- *This maneuver is particularly painful in some facial pain syndromes that are relieved by cervical treatment*

Supraorbital Headache

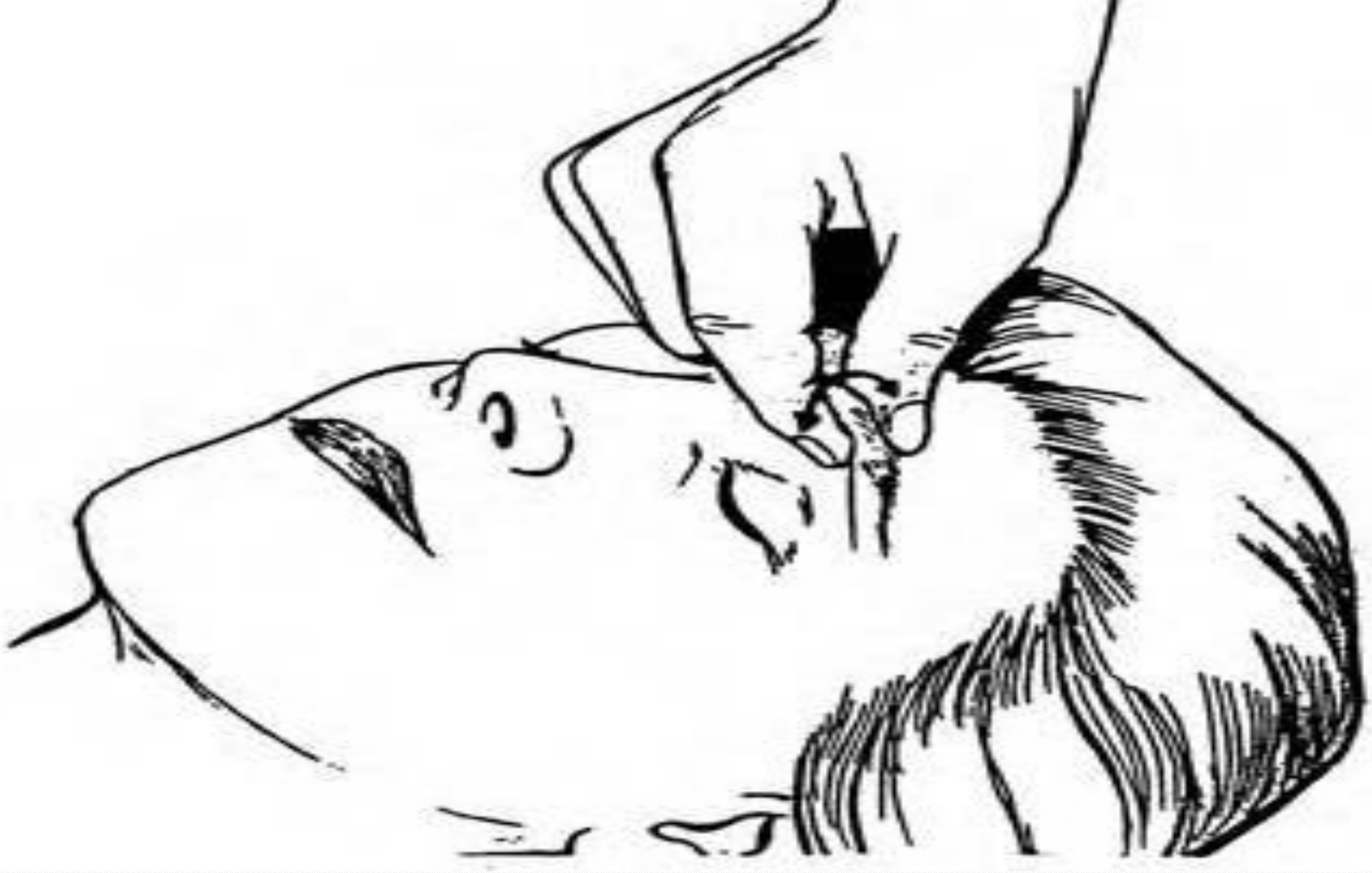
- *Supraorbital headache is the most frequent headache of cervical origin (67% of cases in our statistics). The topography of the pain is usually supraorbital, sometimes*

  occipitosupraorbital, and in a few cases, retro-orbital. It always carries with it the "eyebrow sign.

Eyebrow Sign (Maigne)

- *The eyebrow is pinched between thumb and index finger and kneaded and rolled like a cigarette. It is explored from one end to the other, going over the skin of the forehead . When the sign is positive, the fold is painful and often thickened throughout all or part of the length of the brow.*

- *This sign is found only on the side of the usual headache, which is generally the side of the C2–3 articular pain. The maneuver is painless on the other eyebrow, except in cases of bilateral headache.*



Different Aspects of Supraorbital Headache of Cervical Origin

- ***Simple form :****The most common form, it involves supraorbital or occipitosupraorbital pain*

- ***Vascular form :****In this less frequent form with supraorbital pain, the patient also has nasal congestion (the nostril is clogged with or without rhinorrhea) and occasionally a unilateral tearing.*

Different Aspects of Supraorbital Headache of Cervical Origin

- ***Migrainous form :****In some cases, the migrainous form has the characteristics of true migraine. It is a nonalternating migraine, localized always on the same side during successive attacks.*

- *It often responds poorly to anti migraine medications, but cervical treatment is very useful*

Manipulation for cervicogenic Headache

- *Manipulation is one of the treatments used to decrease dysfunction and help the patient. Much of the data necessary to use manipulation effectively come from palpatory assessment rather than high-tech testing.*
- *Simple soft tissue techniques are designed to relax tight muscles and fascia. Forces applied too fast or too heavy will cause the muscle to fight back.*
- *The response to the application of force is continuously monitored to make sure the muscle relaxes. The focus of the practitioner during treatment is to assess how the patient is responding to the treatment rather than whether the gamma gain has been reduced.*

Manipulation for cervicogenic Headache

- ***Various Types of Manual Medicine***
- ***Direct Techniques :***
- ***Soft Tissue Technique, Articulatory Treatment, Mobilization With Impulse (Thrust; High Velocity, Low Amplitude) , Muscle Energy (Direct Isometric Types) , Direct Myofascial Release***
- ***Indirect Techniques :***
- ***Strain-Counterstrain , Indirect Balancing, Indirect Myofasdal Release , Craniosacral***

INDICATION OF MANIPULATION

- *It is absolutely necessary to be able to identify that the Manipulation is a global gesture that can be broken down in all cases to its elementary components with*

  respect to the three cardinal planes
- *The degrees of freedom available for spinal segmental motion are flexion, extension, lateral flexion (both to the right and left), and right and left rotation.*
- *Manipulation can, therefore, be performed in all these orientations, isolated or combined*

INDICATION OF MANIPULATION

- *To accurately and precisely describe a given manipulation so that it can be rapidly and easily conveyed to others, exactly reproduced, or recorded in the chart, the examiner should do the following.*
- *Designate the segmental level at which the manipulation is performed.*
- *Specify the exact direction given to the maneuver.*
- *Indicate the technique used.*

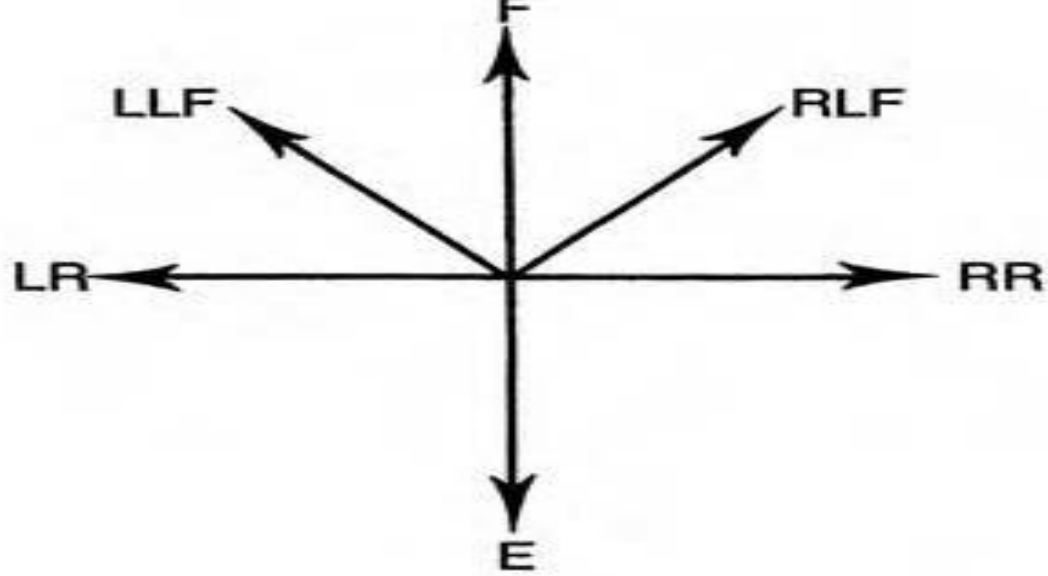
RULE OF NO PAIN AND OPPOSITE MOVEMENT (MAIGNE)

- *For any case necessitating a manipulative treatment, there are useful maneuvers, harmful and dangerous Maneuvers , and in different maneuvers , i.e., maneuvers that are neither helpful nor harmful.*
- *The examiner should find the former and avoid the latter, determining the direction of the maneuver that gives the best results*
- *The rule of no pain and opposite movement consists of forcing the passive, free, and painless movement (no pain) rather than the passive and painful movement (opposite movement).*

RULE OF NO PAIN AND OPPOSITE MOVEMENT (MAIGNE)

- *The result of the clinical examination is reported on a schema in the form of a six-branched star showing the directions of the spinal movement . Showing the directions of the spinal movement . The coordinates of the necessary manipulative movement appear*

This rule of no pain and opposite movement implies the necessity of describing exactly the techniques and their directions that are adapted to each case. This means that we have to proscribe the standard techniques and the routine of manipulating systematically to the right and then to the left. It is fortunate that the lack of precision of most of the standard techniques, which decreases their efficiency, also decreases their possible harmfulness.



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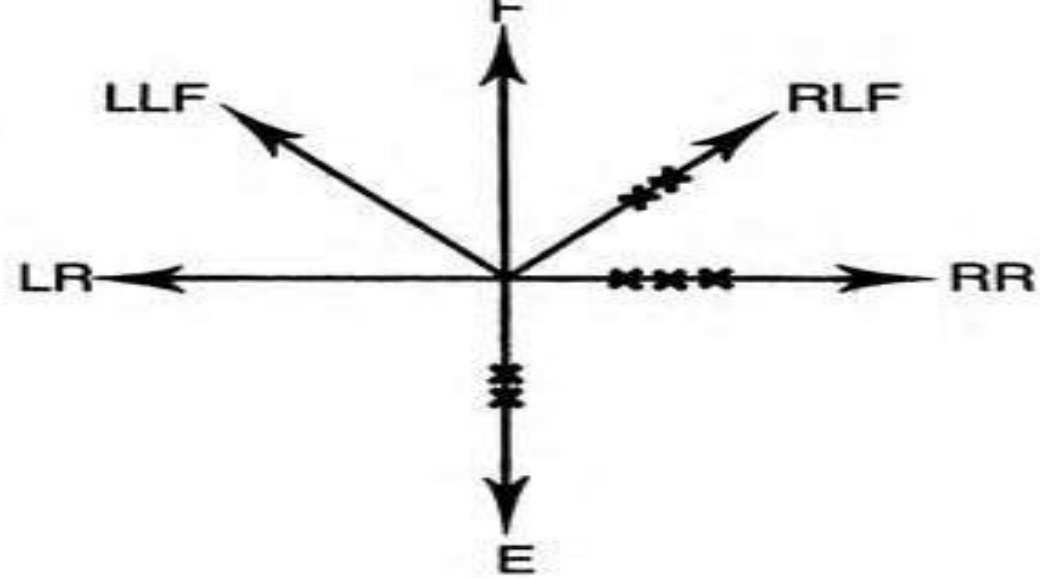

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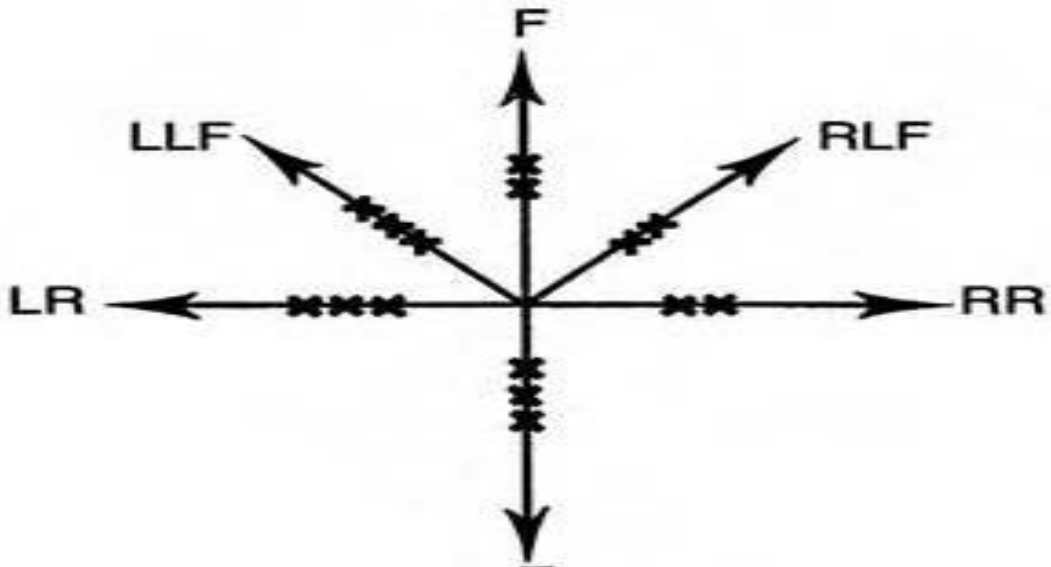

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RULE OF NO PAIN AND OPPOSITE MOVEMENT (MAIGNE)

- *In practice, the manipulative treatment will have a good chance of success when at least three degrees of freedom are available.*

- *If there are only one or two free directions, repetitive mobilization can be applied in these directions ,and its effect can be estimated before manipulation is performed.*

Technical Contraindications to Manipulation

- *If all directions are painful, all branches of the star diagram are crossed out and no manipulation is possible.*
- *This is common in infectious, inflammatory,or tumoral lesions, etc. the disorder is a "technical contraindication" to manipulation*
- *A distinction must be made between clinical and technical contraindications*
- *The former are disorders of a non mechanical nature for which manipulation should not be used and, moreover, could be dangerous, as in cases in which osseous or vascular conditions preclude its use*

Contraindications for High velocity manipulative techniques

- *Unstable Fractures*
- *Severe osteoporosis*
- *Multiple Myeloma*
- *Osteomyelitis*
- *Primary Bone Tumors*
- *Paget Disease*
- *Any Progressive Neurological Deficit*
- *Spinal Cord Tumors*
- *Cauda Equina Compression*
- *Central Cervical Intervertebral Disk Herniation*

Contraindications for High velocity manipulative techniques

- *Hypermobile Joints*
- *Rheumatoid Arthritis*
- *Inflammatory Phase of Ankylosing Spondylitis*
- *Psoriatic Arthritis*
- *Reiter Syndrome*
- *Anticoagulant Therapy*
- *Congenital Bleeding Disorders*
- *Acquired Bleeding Disorders*
- *Inadequate Physical and Spinal Examination*
- *Poor Manipulative Skills*

ERRORS OF MANIPULATION

- *Errors in Diagnosis*
- *Errors in Rheumatology*
- *Errors in Neurology*
- *Vertebrobasilar Insufficiency*
- *Thromboembolic Vertebrobasilar Insufficiency*
- *Vertebrobasilar Insufficiency Due to Osteophytes Compressing Spinal Artery*

Signs of Vertebrobasilar Insufficiency

- *Vertebrobasilar insufficiency is an absolute contraindication to the use of cervical manipulation. Its signs (listed below according to Rancurel and Vitte) should be very well known.*

Headache (benign, often occipital)

Vestibular problems

- *Positional rotary vertigo*
- *Episodic vertigo of central origin*

Visual problems (often temporary)

- *Blurred vision*
- *Diplopia*
- *Amaurosis Fugax*

Signs of Vertebrobasilar Insufficiency

Concentration and loss-of-consciousness problems

- *Syncopal episodes*
- *Temporary periods of coma*

Motor problems

- *Drop attacks*
- *Transient hemiparesis*

Auditory problems

- *Deafness*
- *Hypoacusis*

ACCIDENTS AND INCIDENTS OF SPINAL MANIPULATION

- *Dramatic Accidents*

some of them fatal, is a mistake in the diagnosis or an absence of diagnosis.

- *we should aware of the possibility of post manipulative vascular accidents happening even in the absence of any predisposing factors that could be clinically or radiologically discovered*
- *In general, these are due to thrombosis of the trunk of the spinal artery or of the postero- inferior cerebellar artery (Wallenberg syndrome), whose evolution can be fatal or result in significant sequelae*

Prevention of Accidents: Postural and Rancurel's Tests

- *The postural test consists of maintaining the superior cervical spine of the patient in a position of hyperextension, with first right then left rotation for a few seconds, interrupted immediately at the least feeling of vertigo or nystagmus*
- *Rancurel's test consists of compressing the spinal arteries in Tillaux's triangle, with the patient standing*

Expert panel's guideline on cervicogenic headache: The Chinese Association for the Study of Pain recommendation

Hong Xiao, Bao-Gan Peng, Ke Ma, Dong Huang, Xian-Guo Liu, Yan Lv, Qing Liu, Li-Juan Lu, Jin-Feng Liu, Yi-Mei Li, Tao Song, Wei Tao, Wen Shen, Xiao-Qiu Yang, Lin Wang, Xiao-Mei Zhang, Zhi-Gang Zhuang, Hui Liu,Yan-Qing Liu

- *Cervical manipulation and mobilization are recommended for CEH (Evidence quality: moderate; Recommendation strength: strong).*
- *In a large clinical trial, which evaluated 200 patients with CEH, patients assigned to 6 wk of active treatment with either manipulative therapy, low-load endurance exercise therapy or a combination of both therapies showed a significant reduction in headache frequency at 12 mo. The effect size was reported as moderate and clinically relevant*

Manual therapies for cervicogenic headache: a systematic review (Aleksander Chaibi • Michael Bjørn Russell)

- *The literature search identified seven RCT on CEH that met our inclusion criteria. One study applied physiotherapy ± temporomadibular mobilization techniques and six studies applied cervical spinal manipulative therapy (SMT)*

- *Current RCTs suggest that physiotherapy and SMT might be an effective treatment in the management of CEH.*

- *However, the RCTs mostly included participant with infrequent CEH. Future challenges regarding CEH are substantial both from a diagnostic and management point of view.*

CERVICOGENIC HEADACHES: AN EVIDENCE LED APPROACH TO CLINICAL MANAGEMENT

Phil Page, PhD, PT, ATC, CSCS, FACSM

- *Because CGH is related to cervical joint dysfunction, most studies on CGH treatment have focused on joint mobilization and manipulation.*
- *Several studies of varied research designs have shown that spinal manipulative therapy (SMT) is effective for CGH, particularly those focused on treatment of the upper cervical segments.*
- *Systematic reviews of randomized control trials using manual therapy in CGH patients suggest better outcomes compared to no treatment, although there is a need for more high quality clinical studies.*
- *Both mobilization and manipulation are effective for treatment of patients with cervical pain,*
- *although manipulation appears superior to mobilization in the short term.*
- *In addition, patients with neck pain with or without headache have more short term relief when manual therapy is combined with exercise as compared to exercise alone.*

Effectiveness of manual therapy in the treatment of cervicogenic headache: A systematic review

(Patricia Núñez-Cabaleiro PT, Raquel Leirós-Rodríguez PhD)

- *The MT techniques could be effective in the treatment of patients with CH.*
- *The techniques evaluated included SMT, Mulligan's SNAGs, ischemic trigger point compression, suboccipital musculature relaxation, Jones technique, and vertebral translatory mobilization, and all of them improve symptoms caused by CH.*
- *Among the wide variety of methods and techniques that have been evaluated, upper cervical SMT appears to be the most effective.*
- *In the short term, the Jones technique on the trapezius and ischemic compression on the sternocleidomastoid achieve immediate improvements, whereas adding SMT to the treatment can maintain long-term results.*
- *In addition, the combination of different techniques, such as muscle energy techniques, SMT, and Mulligan's SNAGs, are interesting approaches for the treatment of CH. Strengthening of the deep neck flexors seems to play a fundamental role in the recovery of patients with this condition.*