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Accessory phrenic nerves. An anatomical controversy entailing clinical implications

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In medical literature there is no consistency or consensus on the concept of accessory phrenic nn. or of supplementary secondary roots of the phrenic n. The common occurrence of phrenic nn. is either looked upon as being limited (F. Grigorescu-Sido) or fairly significant (Benninghoff) or extremely high (W. Dauber). A number of authorities interpret certain supplementary roots of the phrenic n. as being accessory phrenic nn. while other roots do not fall under the very same interpretation, the choice appearing as made more or less at random. An attempt at making clear and systematising the concept of accessory phrenic nn. 110 dead bodies of foetuses, children and adults were dissected in the lateral area of the neck. The dissection was extended in the anterior triangle of the neck and into the axilla, with exposure of cervical and brachial plexuses. The accessory phrenic nn. are long nervous structures originating in multiple nervous sources which join the main phrenic n. within the thorax or all the way up to thoracic aperture (cervical accessory phrenic nn. and thoracic nn. respectively). 49 cases (~45%) of the surveyed lot demonstrated accessory phrenic nn. which, according to their course, as compared to the main phrenic n, we classed as follows: lateral accessory phrenic nn. (32); in terms of origin they stem from the anterior branch of the fifth spinal cervical n. (12 cases), from the upper segment of the brachial plexus (6 cases) and from the subclavius n. (16 cases); medial accessory phrenic nn. (17); in terms of origin these stem from the deep cervical ansa (8 cases), the upper portion of the cervical plexus (6 cases) and from the vagus n. (3 cases). According to the point they join the main phrenic n, we found out that lateral accessory nn. may subdivide into 3 types: short (12), intermediary (18) and long (2), depending on whether joining is made in the cervical area, in the thorax above the pulmonary pedicle or under it. The accessory medial group also subdivides into 3 types: short (12), intermediary (5) and long (not met by as but signalled by Max Clara). As a conclusion the following are to be considered: there is a considerable variety of nervous structures which may pass as accessory phrenic nn.; hence the difficulty of having them classed; the attempt is vain to draw a parallel between the accessory phrenic n. type and the real origin of nervous fibres of its neuronal structure (correspondence with the neuromere); the course of accessory nn., in the cervical area is as a rule parallel to the main body, along the anterior aspect of the anterior scalene m.; knowledge and exposure of accessory phrenic nn. are of practical consequence mainly in performing total phrenicotomies (J. Quenu).

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The double axillary vein. Constancy or accident ?

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Background. In this paper, the authors present the anatomical variations of the axillary v. encountered along 9 years of surgical operations for breast cancer, during the axillary lymphadenectomies. A prospective clinical study was performed in order to assess the anatomical variations of the axillary v. in women surgically treated with mastectomy and lymphadenectomy in the 2nd Clinic of Surgery of the Clinical County Hospital Constanta, between 1990-1998. The study was performed on a group of 265 patients surgically treated for breast cancer. We discovered the presence of the double axillary v. in 8 cases (3.01%). Among this 8 cases, 2 (25%) were on the left side and 6 (75%) on the right side. The lateroposterior rapport with the axillary v. and with the medial trunk of the brachial plexus change, occurring anatomical variations. The double axillary v. was encountered in 3% of the cases operated for breast cancer in the 2nd Surgery Clinic; we consider it as a particular anatomical variation which involves a change of the surgical strategy and technique in the dissection of the axillary v. during the axillary lymphadenectomies in breast cancer.

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An investigation of the morphological variations of the brachial plexus trunks by microdissection technique in human foetuses

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The formation, position and morphological variations of the brachial plexus are of great practical importance to the surgeon during the emergency surgery. It is always indicated when multiple injuries have caused brachial plexus palsies. A common formation of the brachial plexus is the first two ventral rami (C5-C6) unit to form the upper trunk, the next (C7) constitutes the middle trunk, and the last two (C8-T1) join to form the lower trunk. Each trunk divides into an anterior and posterior division. Brachial plexus dissections were performed bilaterally in 100 foetuses obtained from Faculty of Medicine and Maternity and State hospitals of Konya. The plexus exposed by a S-shaped incision that follows the posterior border of the sternocleidomastoid m., the upper border of the clavicle to the coracoid and descends in the deltopectoral groove. The platysma and the superficial cervical fascia were separated. The tendon of the omohyoid m. was cut and its bellies retracted. The deep fascia and the fatty tissue were incised and the plexus exposed the ventral rami of spinal n. were looked for behind the scalenus anterior m. After completing the dissection under the microscope (Karl Zeiss Colposcope Plus, Germany) the normal position and/or morphological variations of the trunks of the plexus were

determined and photographed then the diagrams were drawn to clarify and show the variations properly. In the present study, It was observed that the plexus of the lower trunk was not formed in 18 foetuses (9%); the ventral rami of C8 was divided into two branches, the posterior branch joins to posterior fasciculus, and the anterior part with the anterior branch of the T1 forms medial fasciculus. The upper trunk is not formed in the plexus of 2 foetuses (1%); the ventral rami of C5-C6 without joining is divided into two part, the posterior part joins to the posterior fasciculus, and anterior parts unit to form lateral fasciculus together. In plexus of 1 foetus (0.5%), the upper trunk is formed by the ventral rami of C4-C5 (C6 has joined to lateral fasciculus). In another case the lower trunk is formed by the ventral rami of T1-T2. The morphological variations in the vascular structure of the region were not observed. Such variations may have clinical importance when the region is under the consideration for the surgical treatment and the occurrence possibility of them should be considered.

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Functional relationships between sternocleidomastoid muscles balance

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Always more plentiful become the studies about the function of sternocleidomastoid m. (SCM) its involvement in the bone muscular system defined as the neck anterior right chain whose function is to roll the head forward. The above function is very important in relationship between the teeth-occlusal plane and the posture of the cervical part. Several secondary functions involving SCM m. are not well known. This work we'll discuss the role of this muscle and its changes during the basal tonic activity in relation to changing of balance. M.A group of young people aged between 18 and 20 years belonging to both sexes and having different constitution have been considered. The study has been carried out by an electromyograph, type EM2 Myotronic, and very sensible cutaneous silver-silver chloride pre-gelled electrodes applied 3-4 centimetres from the mastoid attachment and 3-4 centimetres from the sternoclavicular attachment. The experimented positions studied were: orthostatic position, trunk forward leaning, trunk behind leaning, sitting position, right foot supporting, left foot supporting, on tip-toe standing, on back lying.

SCM m. proximal part has shown the following order of decreasing activity: trunk behind leaning, on tip toe standing, trunk forward leaning, on back leaning, sitting position, orthostatic position; whereas the distal part has shown: trunk behind leaning, trunk forward leaning, on tip toe standing, sitting position, orthostatic position, on back lying. After considering the achieved results we are able to conclude that the engagement of SCM m. is clearly different in the experimental conditions carried out and in its two parts. Only during the trunk behind leaning the two parts have shown more activity.

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Sternocleidomastoid muscle and eye movements. An EMG study

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Beginning at its role in anterior flexion of the neck or in the lateral movements, well known the main functions of the sternocleidomastoid (SCM) are. Also its importance appears in its function in maintaining the head right position counterbalancing the extending function of the cervical part of the trapezius m. The always much more deepening knowledge about muscular chain has allowed to give this muscle some roles in other functions. In this study we'll discuss the SCM roles or rather the variations of its tonic basic activity changes during eye movements. We have led our investigation by using electromyography on 10 young subjects of either sex 18-20 years of age. We have employed cutaneous electrodes applied on the proximal part and on the distal part of SCM attachments. We have recorded the E.M.G. during the following positions: glance in horizontal position; upward glance; upward and right glance; upward and left glance; downward glance; downward and right glance; downward and left glance. We can summarise our results as following: during the horizontal glance position, upward glance and downward glance, the changes of tonic basic activity of both parts in these three experimental conditions remain rather low and only a little different to each other. Right SCM m. role is particularly increased during the position of upward and the left glance, while in the position of downward and left glance its role is the same. These early experimental data show that tonic basic activity of the SCM m. is very different in the several experimental conditions. Particularly in the horizontal glance position we have recorded a good balance between both muscles and with a low engagement of its both parts.

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Considerations on phrenic nerve origin and formation

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An attempt was made to elucidate some controversies of anatomical literature as regards the "origin" and the "formation" of the phrenic n. On 110 dead human foetuses (aborted or dead in utero), children and adults (aged 1 through 75 years) of both sexes, we dissected the lateral triangle of the neck and the sternocleidomastoid area, the anterior triangle of the neck and of the axillary area bilaterally, tracing the components of the brachial plexus. Our survey disclosed a wide variety of the ways the phrenic n. is formed. These were systematised according to the number of roots which take part in phrenic n. formation. The phrenic n. arise in the lateral area of the neck from the branches of the anterior ramifications of the 2nd, 3rd and 4th cervical nn., from the medial and lower loops of the cervical plexus, from the anterior ramification on the 5th cervical n. and/or from the upper trunk of the brachial plexus. These ramifications are