The Assessment of the Intracranial Part of the Internal Carotid Artery

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Summary. The intracranial part of the internal carotid artery was plotted by linear and angular measurements made on 100 normal angiograms both in sagittal, half-axial and lateral projections. After the mean values and standard deviation measurements had been calculated a model was devised to facilitate the evaluation of the shape and position of this artery in pathological conditions.

The aim of this paper was to find a model for an objective assessment of the intracranial part of the internal carotid artery (ICA). This task was divided into two parts, viz.:

a) the determination of the most common shape of the singular segments of the ICA;
b) the determination of the ICA position against the reference system of linear and angular measurements.

The bibliography provides rather spare information concerning the objective assessment of the intracranial part of the ICA. Bull and Shunk (1962) analysed the intracranial segment of the ICA. Udvarhelyi, Langfit and Cox (1963) used linear and angular measurements for determination of the course of the ICA and anterior cerebral artery in the cases of suprasellar tumours.

In this paper the shape of the ICA was analysed on sagittal, half-axial and lateral angiograms. The ICA was divided into five segments, following Fischer. The points separating the segments were determined as C1 - C5. The bifurcation of the ICA was called “B” and the most frontally situated point of the knee of the carotid siphon was described as ApC (apex carotis). 100 angiograms of adult subjects aged 20 - 64 years were analysed. There were 58 men and 42 women. In the cases which have been analysed neither the clinical findings nor the supplementary examinations showed any evidence of an intracranial expanding process resulting in eventual shifts of the intracranial structures.

Observation over about a 5 years’ period was an additional factor eliminating an intracranial tumour.

Cerebral angiography was performed through the direct puncture of the common carotid artery. The film-changer with a constant focus-film distance of 80 cm was used.

The following reference lines were chosen:

a) in the sagittal view — the midline;
b) on the lateral arteriograms — the nasion-opisthocranion (N - O) line.

Fig. 1. The measurements in the sagittal, half-axial view. Linear distances of points “B”, C1 and C5 from the midline. The angle formed by the axis of the segment C1 with the midline. Mean values and the range of standard deviation.
Fig. 2. The position of points C1 - C5 in the lateral view referred to the N - O (nasion - opisthoeranion) line. The index of the position of these points and the vertical distance is indicated together with the standard deviation.

Fig. 3. The angular measurement characterising the relation of segments CII and CIV.

Fig. 4. The angle between the segments CIV - CV.