It is largely accepted in Europe that the tentorium has two sources of blood supply: one close to the margin (the marginal tentorial artery, also called "Bernasconi's artery" when it was first described supplying tentorial meningiomas), the other following the petrous ridge and called the basal tentorial artery. These arteries arise from varied sources, with possible sites of origin in the free margin of the tentorium as follows: the C5 portion of the carotid siphon, C3 portion of the carotid siphon (the inferolateral trunk of the internal carotid artery), accessory meningeal artery, intraorbital ophthalmic artery, intraorbital lacrimal artery, or middle meningeal artery (frontal branch). The basal tentorial artery is, in fact, an arterial ramp above the petrous ridge and is successively fed from the rostral to caudal direction by a branch of the C3 portion of the carotid siphon, the petrous branch, and the petrosquamosal branch of the middle meningeal artery.

As far as the meningohypophyseal trunk described by Dr. Parkinson is concerned, it is well recognized that it represents the most frequent site of origin of the petrous branch, and the petrosquamosal branch of the middle meningeal artery.

In summary, it is largely accepted that the petrous ridge is the most frequent site of origin of the petrous branch, and the petrosquamosal branch of the middle meningeal artery.

I am sure, as Dr. Parkinson advocated in his letter, that Dr. Rhoton will be glad to have the opportunity to correct some of the omissions in the bibliography in the article by Ono, et al.

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References

RESPONSE: We acknowledge the excellent contributions of Dr. Lasjaunias and his colleagues to this area and are happy to see them outlined here.

ALBERT L. RHOTON, JR., M.D.
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Detection of Intracranial Vascular Lesions

TO THE EDITOR: The report by Sekhar and Wasserman describes the use of the electronic stethoscope to reveal intracranial aneurysms, arteriovenous malformations, and carotid-cavernous fistulas (Sekhar LN, Wasserman JV: Noninvasive detection of intracranial vascular lesions using an electronic stethoscope. J Neurosurg 60:553–559, March, 1984). This does indeed suggest an enhancement of our neuradiologic capabilities. It might also be mentioned that other intracranial lesions, which are highly vascular but not composed solely or primarily of blood vessels, can be accompanied by an audible bruit. Among these are meningiomas.

MICHAEL H. SUKOFF, M.D.
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Reliability of ICP Measuring Devices

TO THE EDITOR: Dearden, et al., have found that the Leeds device for monitoring intracranial pressure (ICP) did not always produce consistent readings (Dearden NM, McDowell DG, Gibson RM: Assessment of Leeds device for monitoring intracranial pressure. J Neurosurg 60:123–129, January, 1984). At a conference on ICP at Groningen in 1976, I presented a poster display which predicted this variability by using simple mathematics. My findings were subsequently published.

The basic problem with the Leeds device is that it produces a baseline or zero error. The magnitude of which depends on the tension and shape of the membrane across which the pressure is being transmitted. If the cavity from which the pressure is being measured has walls of arachnoid or dura, or both, then the elasticity or tension in the walls of the cavity is not only unknown, but it is also continuously and unpredictably variable for at least two reasons. First, repeated filling and leakage will vary the volume and shape of the cavity; second, inflammation of the membranes will change their physical properties from day to day. Both the volume of the cavity and the elasticity of the walls are factors that affect the transmission of brain tissue pressure to the transducer. If they are continuously and unpredictably variable over time, then the baseline or zero error is also variable.

Similar problems affect the Richmond screw; that is, the volume of the cavity and the properties of its walls are continuously and unpredictably variable, and consequently the zero error is continuously and unpredictably variable also.

A study of the factors involved in the transmission of tissue pressure of the brain (which is what we need to know) to a transducer surface suggested the following conclusions:

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1. That if extradural or subdural pressure measurements are used, then a) the device must be relatively flat and thin in proportion to its height, like the Ladd apparatus, or b) the membrane must be precisely parallel to and in contact with the surface of the transducer; that is, a transducer screwed into a burr hole must have its axis exactly at right angles to the dura, there must be no clot around it, and it must not indent the dura.

2. That if the pressure was measured from bags introduced into the cranium (not uncommon in animal experiments), the bags must be flat and flabby, and not filled to produce a roughly rounded shape.

3. That ventricular pressure is probably the best representative of tissue pressure. Another, possibly even better, method would be simply to place the transducer directly into the tissues, a procedure that only requires 2 cm of intrusion into the brain, less than is accepted for cannulating the ventricle.

The mathematical data seem to have discouraged people from understanding my conclusions, so I have omitted them here.

Wellington, New Zealand

Reference


RESPONSE: In his interesting comments on our paper, Mr. Martin says that the Leeds device reads pressure within a cavity partially separated from the general intracranial cavity by arachnoid or dura. However, in our paper we gave results for intracranial pressure (ICP) monitoring in patients whose arachnoid had been opened. If the measurements were obtained from a subdivision of the intracranial space, then it was the same subdivision as occupied by the surface cerebrospinal fluid (CSF). There is one group of our measurements to which Mr. Martin's comments certainly apply; that is, in patients with problems of pocketing around the device or plateauing of the ICP. In these cases we envisaged that swollen brain or arachnoid, together with clotted blood, produced a membrane separating the measurement site from the general surface CSF space. In these instances we agree with the conditions defined by Mr. Martin as being necessary for valid measurement.

Mr. Martin concludes his letter by stating that: “Ventricular pressure is probably the best representative of tissue pressure.” We would contend that the Leeds device, when functioning satisfactorily, reads surface CSF pressure, which is virtually the same as ventricular pressure, and does so without inflicting the brain trauma of ventricular catheterization. In our experience, ventricular catheters in head-injured patients produce at least as many technical problems as does the Leeds device due to blockage with ventricular debris and to ventricular shift. It is not clear to us what Mr. Martin means by tissue pressure, which he says is best measured in the ventricle. In our view, tissue pressure varies widely from site to site in the traumatized brain, and we know of no way of measuring the “worst case” tissue pressure clinically. The placement of Wick catheters at random sites would seem to be unlikely to provide information of greater value than general ICP in the management of head injury.

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Resistance to Reabsorption of CSF: Erratum

To THE EDITOR: In my Letter to the Editor in the July issue (Johnston RA: Resistance to reabsorption of CSF. J Neurosurg 61:204, July, 1984), a phrase has unfortunately been omitted in the last sentence of the first paragraph. The sentence should read: “This latter figure is very close to the Ra value in the report by Vela, et al., expressed in mm Hg not cm H2O.” Units are important!

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Management of Klippel-Feil Syndrome: Correction

To THE EDITOR: It has come to our attention that there is an error in Table 3 in our manuscript (Nagib MG, Maxwell RE, Chou SN: Identification and management of high-risk patients with Klippel-Feil syndrome. J Neurosurg 61:523–530, September, 1984). In the side heading “Group III: Patients with associated spinal cord stenosis,” the word “cord” should be “canal.” “Spinal cord stenosis” is incorrect. The authors regret the error.

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