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THE CLINICAL ASPECT OF VERTIGO

BY

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Cases of vertigo are often sent to the aurist to determine whether the ear is the cause. Aural vertigo has distinctive features, and furthermore is accompanied by tinnitus and deafness. Though patients find it difficult to describe their symptoms accurately, and though their description of giddiness differs, the large majority of patients with aural vertigo state that there are sudden attacks of a sensation of rotation, with a tendency to fall to the side of the deaf ear. If the vertigo is severe, or during the first few attacks, vomiting and even diarrhoea follow; but the vomiting and diarrhoea are only indications of the severity of the vertigo. Labyrinthine nystagmus is present during an attack, but it is usually absent during the quiescent intervals. Sometimes the nystagmus can be reproduced by rapid movement of the head, but the fistula phenomenon is rare and not often obtained. The fistula phenomenon means that the compression or suction of the air in the auditory meatus obtained by the application of Siegle's speculum or small rubber bag produces vertigo and nystagmus. This phenomenon indicates a fistula of the external semicircular canal or inner wall of the tympanum, and also that the labyrinth is active and not defunct.

Diagnostic Tests

The defective ear is generally hypersensitive to the cold-air or irrigation test. If tested by the Dundas-Grant cold-air insufflator, a fine rotary nystagmus is seen, and is most marked when the patient looks away from the tested ear. The pupil is slightly dilated, and the patient complains of vertigo. If the vertigo thus produced is similar to that which occurs during an attack it indicates that the ear is the probable cause. Frequently there is an active labyrinth even when the tested ear is very deaf and it is supposed that the lesion is limited to the cochlea and that the semicircular canals have escaped. The cold-air test is less severe and more easily applied than cold-water irrigation. The test should be discontinued immediately there is any sign of reaction, in order to avoid undue disturbance of the patient.

The diagnosis of aural vertigo is still further confirmed when a lesion of the ear, usually associated with vertigo, is present. Moreover, it has been noticed that one ear only is affected—that is, the lesion is unilateral. There appears to be a want of symmetry of the labyrinthine apparatus.

Pathological Changes in Aural Vertigo

It is important to decide what are the lesions or what are the pathological changes found in the ears in cases of aural vertigo. It is recognized that there is an irritation or increased excitability of the labyrinth. It has also been accepted for many years that Ménière's syn-

drome or triad of symptoms—vertigo, tinnitus, and deafness—is caused by some disturbance or affection of the internal ear. It has been handed down in numerous textbooks that the distinctly rare condition, true Ménière's disease, was an apoplexy or haemorrhage into the semicircular canals; but Dan McKenzie, in his researches into Ménière's own writings, could not find any evidence to support this theory of apoplexy. It is probable that such a lesion has occurred in leukaemia or in similar blood conditions, but it must be very rare.

If the auditory nerve was like the optic nerve and could be seen by such an instrument as the ophthalmoscope, we should perhaps have a better knowledge of the clinical pathology of the internal ear; but at present we can only make comparisons by analogy with diseases of the optic nerve. Hence there are still a number of cases of vertigo in which the character of the lesion of the ear is unknown.

Analysis of 100 Cases

There are certain clinical conditions and certain types of lesions which are associated with vertigo. I have studied the notes of one hundred cases of vertigo seen by me and in which thorough investigations have been made. Those cases in which the investigations were incomplete or in which the patients had not been followed up have not been included.

The following is the result of the aetiological inquiry from a clinical point of view:

Traumatism	...	...	...	...	...	3
Acute otitis media	...	...	...	...	...	4
Acute suppuration or exacerbation of a chronic suppuration	...	...	...	...	...	8
Chronic suppuration	...	...	...	...	...	15
Secondary sclerosis	...	...	...	...	...	18
Healed suppuration	...	...	...	...	...	
Eustachian obstruction	...	...	...	...	...	2
Otosclerosis	...	...	...	...	...	15
Cerebellar abscess	...	...	...	...	...	3
Tabes	...	...	...	...	...	2
Thrombosis of the posterior inferior cerebellar artery	...	...	...	...	...	1
Disseminated sclerosis	...	...	...	...	...	6
General intestinal and circulatory	...	...	...	...	...	4
Cause unknown (Ménière's disease)	...	...	...	...	...	19

Most of these patients were suffering from a direct vertigo due to a lesion of the vestibular apparatus because the ear was already under suspicion, and they were sent to me for that reason. The cases of indirect vertigo—that is, a disturbance of the vestibular apparatus following, for instance, gastro-intestinal trouble—were few. To take each heading individually:

The three *traumatic* cases were considered to be due to injury to the central nervous system, and at most were cases of indirect vertigo. No lesion of the ear could

be found and the vertigo disappeared after a period of rest and convalescence.

The four cases of vertigo associated with *acute otitis media* were of short duration, and recovered with the disappearance of the otitis media and did not recur.

There were only two cases of catarrhal *Eustachian obstruction*, and I am somewhat sceptical about catarrhal Eustachian obstruction being a cause of vertigo. These two cases were apparently relieved by a catheter inflation and by the passage of the bougie.

The eight cases of an *acute exacerbation of chronic suppuration* of the attic were the most satisfactory. The vertigo disappeared after the performance of a modified radical mastoid operation without opening or interfering with the labyrinth. In two cases a fistula of the ampulla of the external semicircular canal was found. In two pus was found in the middle ear dammed up by granulation tissue. In all the cases definite infection of the bone of the attic region was discovered, and when supuration is present vertigo is an emphatic indication for a mastoid operation. The same may be said of the fifteen cases of *chronic suppuration*. A number of the cases showed a healed attic suppuration in which the vertigo then disappeared, but the labyrinth remained just as active and as excitable to the irrigation test as during the period of vertigo.

The eighteen *secondary sclerosis* cases were difficult and required prolonged treatment, with indifferent results. In a few of these cases with marked deafness and severe vertigo a labyrinth operation may be advisable, particularly when the mastoid operation has already been performed.

There were fifteen cases of early *otosclerosis* or chronic progressive deafness. Most of them were young, anxious women of the sea-sick, train-sick type. Fortunately the vertigo disappeared with suitable palliative treatment. Lumbar puncture was performed on some of these cases; the fluid was normal and the result negative. One or two cases of functional excitability of the labyrinth showed improvement after lumbar puncture. Babinski drew off 15 to 20 c.cm. of cerebro-spinal fluid in sixteen cases. He stated that cases of functional excitability of the labyrinth improved after a few days or after a second lumbar puncture. He also found that lumbar puncture did not improve those cases in which there was a definite lesion of the ear. This is what would be expected.

Influence of High and Low Blood Pressure

Some of the otosclerosis cases showed a low blood pressure. Richard Lake was of the opinion that a low blood pressure was a more frequent cause of vertigo than a high blood pressure. With the exception of this group of otosclerosis cases I have found the blood pressure to be normal, and there were no cases of high blood pressure. I am inclined to believe that the low blood pressure is the result rather than a contributory cause of aural vertigo, also that cases of otosclerosis without vertigo often have a low blood pressure. There is evidence that disturbances of the blood circulation have been the cause of vertigo. Some of the elderly patients complained of vertigo on rising quickly from the prone to the sitting position. The inhalation of amyl nitrite will bring out a latent nystagmus. Theoretically amyl nitrite should improve or abort the vertigo if it is due to anaemia of the labyrinth and increase the vertigo if it is due to hyperaemia. Inhalation of amyl nitrite in cases of arteriosclerosis, high blood pressure, and heart lesions is not without danger. There is a curious type of vertigo labelled "epidemic vertigo," because several members of a household have had it. No adequate cause could be found, and the only physical sign was a low blood pressure. Mygind has shown that compression of

the carotid artery in cases of fistula of the external semicircular canal has altered the character of the nystagmus. These facts indicate that the labyrinth is sensitive to changes in the blood circulation. This question of blood pressure and circulation requires careful and scientific investigation.

Vertigo and Central Nervous Disease

Cases of vertigo arising from diseases of the central nervous system and particularly cerebellar abscess and thrombosis of the posterior inferior cerebellar artery are difficult to differentiate from those of direct vertigo, due to the labyrinth, more especially when they are accompanied by a lesion of the ear. These patients are sometimes too ill to respond to elaborate labyrinthine tests, and yet the differentiation between vestibular lesions and that of the cerebellum is of great importance. The cerebellar cases show greater incoordination of movement and the gait is more staggering. The vertigo occurs on movement only, and does not come on in sudden attacks when the patient is at rest like that of the labyrinth. The nystagmus is a coarser horizontal oscillation and is always present. It is not the fine, fleeting, rotary tremor of labyrinthine nystagmus. There are other signs of a cerebellar lesion such as facial paralysis and abnormality of the reflexes.

There were six cases resembling otosclerosis which have turned out to be early disseminated sclerosis. It is stated that 12 per cent. of the cases of disseminated sclerosis suffer from nerve deafness.

Functional Disturbance of the Labyrinth

Lastly, there were nineteen cases of so-called Ménière's disease in which no definite cause for the vertigo could be found—that is, there was no apparent lesion apart from the unilateral deafness. These cases might be labelled as a functional disturbance of the labyrinth. The labyrinth resembles a fine trigger easily pulled by some external stimulus. The attacks of vertigo were explosive and epileptiform. There was tinnitus and varying degrees of deafness, and the patients were usually middle-aged or elderly, often overworked and worried. The pathology of these cases is obscure, and they are parallel to migraine, epilepsy, and asthma. It is stated that this is the type of case which is due to an increase of the intralabyrinthine fluid and pressure, and it has been claimed that lumbar puncture and water depletion of the body improves these cases. I have had little experience of this treatment by water depletion.

Portman has designed and carried out an operation to drain off the excess of the endolymph through the saccus endolymphaticus. It is a difficult operation, and dilatation of the saccus cannot be diagnosed with certainty. Hautant has done a simpler operation, of opening the external semicircular canal to relieve intralabyrinthine pressure, with success. Cases of increased intralabyrinthine pressure are presumably analogous to glaucoma and may be compared with it. The ophthalmologist has the advantage of being able to measure the intraocular pressure with a delicate gauge known as the tonometer, and so verify any treatment for the reduction of pressure. Depletion therapy for glaucoma was tried in 1915 by Duke-Elder when these patients had been given an intravenous injection of hypotonic saline as in cases of cerebral compression. This treatment has been given up as unsatisfactory, but it was found that there was a decrease in the intraocular tension for twelve hours only. Perhaps one reason for giving up depletion therapy in glaucoma was the need for mental relaxation and quiet. The same applies to vertigo. If the patient is given such a potent diuretic as salyrgan he is in and out of bed every few minutes, with considerable disturbance of sleep. It is

difficult to accept the view that waterlogging of the body should affect the labyrinth on one side only. It is reasonable to expect that both labyrinths would be involved and, being symmetrical, vertigo should not occur. Again vertigo is not a symptom in cases of dropsy subsequent to renal and cardiac disease. However, Mygind and Dida Dederding are in favour of the theory of waterlogging.

Palliative Treatment

Palliative treatment was carried out in the greater number of these cases. Rest in bed and the exclusion of all stimuli likely to produce vertigo, and a mild calomel purge with the administration of luminal (1/2 grain) or bromide, were usually successful. If the blood pressure is low ephedrine or ergotin may be given. Tobacco and alcohol usually aggravate the vertigo, and should be suspended. A careful and detailed investigation of the patient's method of living should be made to find any contributory cause. An attack of vertigo can sometimes be aborted if the patient resolutely fixes his eyes on some neighbouring object and so restores his equilibrium. The psychological element in these cases is very marked, and the patient should be encouraged and reassured. For this reason any definite and detailed line of treatment is sometimes successful, but the variety of drugs and treatments prescribed indicates that at present there is no real specific for vertigo. In spite of this a large proportion of these patients recover. There are a number of cases due to suppuration of the ear in which the mastoid operation alone has been entirely successful and satisfactory. The labyrinth has not been touched and labyrinthotomy or labyrinthectomy has not been necessary.

Operations on the Labyrinth

Operations on the labyrinth for vertigo are comparatively rare, because such an operation is only performed:

1. When the diagnosis that the vertigo is caused by the internal ear is certain.
2. When the vertigo is so severe and frequent as to make the patient miserable and unable to work.
3. When all other remedies have failed.

It must be remembered that the operation destroys the hearing and is not usually performed unless there is a considerable degree of deafness. The cases which fulfil these conditions are few and far between. Richard Lake, who specialized in this operation, performed the labyrinth operation in fourteen cases only. Many patients refuse to have any operation, and improve with palliative treatment. The most satisfactory operation is known as superior and inferior vestibulotomy, in which the ampulla of the external semicircular canal is opened by a fine chisel. The slit-like lumen of the canal is easily recognized. If the chisel is then applied to the little ridge of bone between the fenestra ovalis and fenestra rotundum the promontory is flaked off and the vestibule opened. The nerve ending is destroyed by removing the modiolus with a curette.

Complete excision of the semicircular canals, or labyrinthectomy, is not generally performed, and I venture to say that it is unnecessary.

I have done six cases of superior and inferior vestibulotomy with satisfactory results. Mollison's method of injecting alcohol into the external semicircular canal was adopted and, in addition, the vestibule was opened by removing the promontory. All six patients had had a previous radical mastoid operation. The vestibulotomy or labyrinthotomy was easily performed, and with the present-day technique was not dangerous. After the operation there was considerable post-anaesthetic vomiting, a riotous nystagmus, and increase of the vertigo, but within three weeks the wound had healed and the patients were discharged from the hospital quite well.

One patient who had had a radical mastoid operation done on both sides and was very deaf, had vestibulotomy performed on the right ear. The vertigo continued, and after an interval of three weeks a left vestibulotomy was performed with complete success. The operation has been done for tinnitus, but the result was negative and the tinnitus persisted.

About twenty-five years ago Ballance divided the auditory nerve within the skull to relieve a distressing case of tinnitus. The result was unsatisfactory. Cairns has carried out a similar operation of division of the auditory nerve for vertigo in four cases with success. Dandy has also done forty-two successful operations for vertigo, and, incidentally, in a few only has the tinnitus been relieved. This operation appears to be too formidable and too uncertain to be popular. Vertigo is not dangerous to life except when it arises from suppuration of the labyrinth, which may lead to meningitis.

Summary

Vertigo arising from the ear has distinctive features which make its recognition easy and certain. A hundred cases of vertigo have been classified according to their clinical etiology.

The pathology is discussed. There were no cases associated with high blood pressure. Lumbar puncture has produced negative results. The majority of the cases were given palliative treatment. The mastoid operations in cases of suppuration of the ear were very successful.

The indications for the destruction of the labyrinth or internal ear are the failure of palliative treatment, and a certain diagnosis that the vertigo arises from the ear.

EPIDEMIC STREPTOCOCCUS LARYNGITIS

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"The evidence of modern bacteriology lends much likelihood to the view that epidemic diseases are constantly changing."—HANS ZINSSER.

From time to time medical practitioners have become acquainted with epidemic "sore throats" of streptococcal origin which have been traced to tainted milk or water supplies, and some of the outbreaks have not been free from a comparatively high mortality. In most of the cases the soft palate, fauces, tonsils, and upper pharyngeal regions have borne the chief brunt of the infection. Quite recently indeed (May 25th, 1935) Dr. F. E. Camps of Chelmsford called attention in this *Journal* to such an epidemic in that town at the end of 1933.¹ But according to information we have received from Dr. F. P. Sturm of Leigh, Lancashire, a streptococcus epidemic appeared there during last winter in which the *larynx* was chiefly affected. Reports from localities so widely separated, together with our own recent experiences in London, lead us to suspect that streptococcus throat infections, both pharyngeal and laryngeal, have recently been, and perhaps even now are, much more common and widespread than is generally realized. So far as we know, the laryngeal type of the disease, with which the present paper is chiefly concerned, does not seem to have been hitherto described, probably because the cases encountered have for the most part been mild and sporadic, and, being simply regarded as "influenza" or "a bad cold," have not been submitted to an expert examination of the *larynx*. Never-