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REPORTS
IN
OPHTHALMIC SURGERY.

BY
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REPORTS IN OPHTHALMIC SURGERY.

DOUBLE OPTIC NEURITIS WITH PARALYSIS OF OLFATORY NERVES, AND SENSORY DIVISION OF RIGHT FIFTH NERVE.^a

CASES of double optic neuritis, with consecutive atrophy of the nerves, are so common in ophthalmic practice that I should not have thought it worth while to bring the following case under the notice of the Academy were it not for some special points of interest which it presents, and upon which I should like to elicit the opinion of the members present, whose experience of cerebral disease is so much larger than my own.^b

CASE.—Jane H., aged thirty-two, unmarried, was sent to me recently by my friend, Dr. O'Farrell, of Boyle, with the following history:—Beyond an attack of smallpox in her infancy she had always been a healthy woman, and her family presented no evidences of disease. Of four brothers and three sisters all are alive and healthy, except one brother who died of an injury received in America. Her father died at the age of sixty-seven, and her mother at that of sixty. However, about Christmas time in 1882, she began to suffer from a pain in the front of her head, which at first would come on for only a quarter of an hour or so once or twice during the day, but rapidly became more frequent in its occurrence and more violent in its attacks, until by the end of March, 1883, it was continuous, and so excruciating that early in April she found it necessary to take to her bed solely on account of this pain in her head. Some weeks later—she is not at all certain as to the precise time—she became unconscious. This unconscious-

^a Read in the Medical Section, April 18, 1884.

^b The patient was exhibited at the meeting of the Section.

ness came on very rapidly, if not quite suddenly, and persisted until the end of July, 1883, when she gradually recovered consciousness, and became alive to the alarming fact that her senses of sight, taste, and smell were lost, and that the sensation of touch on the right side of her face, and on the little finger and the ulnar side of the ring finger of her right hand, had also disappeared. Until she became unconscious she states that she suffered from nothing but the pain in her head, all her various organs of sense being in perfect order, but she acknowledges on questioning to a derangement of her stomach and attacks of vomiting during the period preceding the unconsciousness.

Her condition at present is as follows:—

She suffers no pain, and beyond the defects of sense described above, has nothing to complain of in her physical condition. The sense of smell is completely absent in both nostrils, the odours of assafœtida, valerian, and iodoform being entirely unappreciated by the patient. Ammonia produces a slight and indefinite sensation, probably from its action upon the mucous membrane of the left nostril, whose tactile sensibility is unaffected.

Both optic nerves are atrophied, and the preception of light entirely lost in each eye.

The functions of the third and sixth, and, so far as I know, those of the fourth nerve also are unaffected, the motions of the globes in all directions being perfectly normal, and the pupils contracting simultaneously with convergence of the visual axes, although, of course, the pupillary reflex to light is entirely lost.^a

The sensory division of the fifth nerve upon the right side is completely paralysed. Tactile sensibility is absent upon the right half of the head and face, from the median line to a line drawn about one inch in front of the external auditory meatus, and from the vertex to the lower edge of the inferior maxilla. There is evidence of sensibility in the skin over the angle of the jaw, in the external auditory meatus, and over all parts of the external ear; also in the skin covering the posterior portion of the temporal fossa—those portions of the skin which receive branches from the cervical nerves in addition to the filaments coming from the fifth. The corneal and conjunctival sensibility is entirely absent, as well

^aTo-day, April 18th, my attention was called by Dr. Keane to the fact that the light reflex had returned to the right eye. Perception of light is still, however, absent.

as the lachrymal and palpebral reflexes connected with it, but the tension of the globe, so far from being subnormal, is actually slightly higher than that of the other, whose fifth nerve is intact, and as yet no appearance of any trophoneurosis of the cornea is visible.

Sensibility is lost upon the right side of the nose, upper and lower lips and chin, and in the mucous membrane of the right nostril, and on the right side of the tongue, jaws, cheek and hard palate. The sensation of taste is certainly defective upon the right side of the tip of the tongue, and on the right half of the organ in front—sweets, salts, and bitters, being indistinguishable until after the tongue is brought into contact with the palate and the motion of swallowing made, but the sensation of taste is not very acute on the left side of the anterior portion of the tongue either, so that I cannot make any certain deductions as to the distribution of the lingual nerves from the investigation of this case. The patient cannot feel the passage of a constant current on the right side of the tongue at all, but then she does not distinguish the difference between the passage of an electrical current and the simple contact of a silver probe on the left side. She complains of inability to masticate her food on the right side, and the lower jaw when protruded forwards is pushed to the affected side, and when drawn back is dragged towards the sound side, but to the touch the muscles of mastication feel quite as firm and healthy in their functions upon the right side as upon the left.

The protrusion of the tongue seems to be also somewhat towards the affected side.

The electrical reaction of the muscles has not been tested.

The sense of hearing is quite perfect on both sides.

The condition of the optic discs is that of distinct white atrophy their colour being that of white paper—all the vessels, both veins and arteries, being extremely contracted in calibre. The surfaces of the discs appear, if not exactly raised, at least on a level with the most prominent surfaces of the neighbouring retinae. The edges of the discs are rather obscure, and not even but slightly irregular, and all the larger vessels are surrounded by the well-known white boundaries which are figured in ophthalmoscopic atlases as signs of inflammation in the perivascular lymph spaces of the retinal circulation, and which are so frequently found in cases of post neuritic atrophy.

The patient's general health is at present good, and there is no

affection discoverable of either heart or kidneys. She does not now suffer from headache.

Before commenting upon the above facts I wish to express my obligations to my friend and house surgeon, Dr. Keane, for the valuable assistance he has given me in the careful notes he has taken of the case.

The first point I shall touch upon is the condition of the optic discs. To my mind they present distinct evidences of having suffered from a severe attack of papillitis, and are not at all the kind of discs that we see after the occurrence of descending optic neuritis, more properly so called. The filling in of the surfaces, the irregularity of the margins, and the perivascular thickenings, all prove the case to have been one of double optic neuritis—the choked disc of the earlier writers upon the retinal appearances in brain disease.

Unfortunately of all the effects of cerebral disease double optic neuritis has the least localising significance, and beyond indicating generally that there is some tolerably large cerebral lesion present, does not throw any light upon the case whatsoever. Indeed, the light that is required at present is a light upon the causation of optic neuritis in these cases, a question which has been debated by ophthalmic surgeons for some twenty years past, without as yet receiving any universally accepted explanation. The original theory of Von Græfe—that the neuritis is caused by obstruction to the return of blood from the retina, owing to the increase of intracranial pressure—has been long abandoned, since we have known that the anastomoses between the orbital and facial veins are so free that it is sometimes hard to say whether the blood returning from the retina runs more freely into the cavernous sinus or into the facial vein.

The next theory that has been advanced is still on its trial. It is based upon the observation that has been so frequently made in *post mortem* examinations upon these cases, that the sheath of the optic nerve may be distended with fluid, and upon the physiological experiment of injecting fluids from the subdural space in the cranium into the optic nerve sheath, and through it into the lymph

spaces in the nerve at the lamina cribrosa. It is obvious that this dropsy of the nerve sheath may cause neuritis in either of two ways, either mechanically by pressure of the fluid upon the nerve and its vessels, or by the direct influence of the fluid itself brought into contact with the nerve tissue in the lymph spaces in the neighbourhood of the lamina cribrosa.

The probability of this latter view, which attributes directly irritating qualities to the fluid present in these cases, is, I think, somewhat higher than that of the former, for no definite relation seems to exist between the amount of distension of the sheath and the intensity of the neuritis it excites, and cases have been observed both of dropsy of the sheath without neuritis, and of neuritis without apparent dropsy. This is the view which is most generally accepted in Germany, but in this country a rival theory presents itself for public approval, which was first put forward by Hughlings Jackson, and afterwards improved upon by Benedikt. According to these authorities a brain tumour (and as brain tumours are among the most common causes of optic neuritis it is the effect of brain tumours we wish most of all elucidated) may cause inflammation in the optic disc by its acting as a source of irritation to the vasomotor nerves connected with the inflamed part.

This theory seems somewhat far-fetched, and certainly necessitates, as a preliminary to its acceptance, the demonstration that such a vasomotor arrangement exists as would render it possible for a central irritation to produce a definite inflammatory alteration in the tissues of the optic disc.

It must not be forgotten, however, that many cases of inflammation of the disc are true examples of descending neuritis which, propagated along the nerve from the brain, as a slight, apparently insignificant tissue change, becomes an intensely acute inflammation, when the escape of the blood and inflammatory products from the affected area is prevented by a structure like the unyielding sclerotic ring which surrounds the nerve at its entrance into the eyeball.

The next point of interest in the case is the curious association of paralysis of the first nerve with that of the fifth, without any implication of either fourth or third nerves. This is one of the

points to which I would especially like to draw the attention of the members present, as upon it hangs the possibility of localising the cerebral affection, and as I myself am quite unable to arrive at any satisfactory conclusion upon the question. It is to me highly improbable that the disease, which I am inclined to consider a new growth, could be situated in or near the nuclei of the affected nerves, for the new growth is most likely large, as it has existed now for nearly a year and a half, and has caused such severe constitutional and cerebral symptoms, and if it were of any size it must have affected the nuclei of other nerves in close proximity. It is also to me inconceivable how a growth at the base of the brain, which implicated the right fifth nerve and both olfactory bulbs, could avoid affecting the third and fourth nerves of the same side, and indeed I might add the sixth nerve of that side too; so that although I consider the case to be one of cerebral tumour, I am utterly unable to assign any definite position to the new growth.

There is no question connected with ophthalmic surgery that is of more general interest than the much-debated one as to the existence and nature of neuro-paralytic keratitis. Oculists have for long been familiar with the fact that after paralysis of the fifth nerve on one side the cornea on that side is liable to undergo a destructive inflammation, and little doubt was felt as to the neuro-paralytic nature of the inflammation until Snellen's experiments upon rabbits some years ago. He succeeded in producing complete insensibility of the cornea by dividing the fifth nerve, and, by careful protection of the eyeball from external irritants afterwards managed to keep the cornea free from inflammation. He therefore concluded that the so-called neuro-paralytic keratitis is not a trophoneurosis at all, but an inflammation caused by exposure—the anæsthetic cornea being easily injured, and without the patient's notice.

Now, my case harmonises very well with this theory; for although the paralysis has been in existence for some eight months, the frequent winking that occurs simultaneously with that of the other eye, and the tendency the woman has to keep her lids half closed, must have protected this eye to an extent unusual in these cases,

and also she has been principally in the house, and in bed, and not exposed to much danger of corneal abrasions.

However, the existence of a true trophoneurosis can hardly be denied in the rabbit's cornea at all events, since Meissner and Schiff have succeeded, by partially dividing the trunk of the ophthalmic division of the fifth nerve, in producing a keratitis clinically indistinguishable from the neuro-paralytic variety, although the corneal sensibility remained perfectly intact. They conclude from these experiments that the trophic fibres of the cornea run on the internal side of the ophthalmic division of the fifth nerve as it leaves the Gasserian ganglion, and account for cases where corneal sensibility is absent, as in mine, without the supervention of inflammation, by the supposition that the lesion has spared these trophic fibres.

Another point of exceeding interest in this case is the existence of a higher tension in the eyeball with the paralysed fifth nerve than in that on the other side. It is well to get hold of one concrete fact bearing upon so debatable a subject as the influence of the fifth nerve upon intraocular tension. Hirschberg observed the exact reverse of what is to be found in my case, but Erb discounts his case in consequence of the presence of paralysis of the external ocular muscles complicating the effects produced by paralysis of the fifth nerve alone. In my case the other ocular nerves are quite sound, and the fact of the tension of the right eye being higher than that of the left has been observed by all the experts who have examined the case. Both Dr. Arthur Benson and Dr. Keane noticed it before their attention was called to the other differences between the two sides of the face, and at the time I made the observotion myself I was not acquainted with the published statements upon the question, so that my judgment was also unbiassed in the matter.

In concluding the rather disjointed remarks I have made upon this interesting case, I would suggest the following points for discussion :—

1. Is the affection caused by a new growth within the cranium, and, if so, what locality should be assigned to the tumour?

2 What is the most probable theory to account for the occurrence of optic neuritis in cases of cerebral tumour?

3. Is the cornea the seat of a true neuro-paralytic inflammation, or can the keratitis that occurs in these paralysis cases be accounted for simply by exposure?

[Since writing this paper I have carefully tested the condition of the salivary secretion in this patient by means of a rod dipped in vinegar, and I am able to state that the secretion of saliva from the parotid gland of the right side is, if not completely absent, at least so diminished, as compared with that of the left side, as to be by this test utterly undemonstrable. While the application of the vinegar to any portion of the mucous membrane on the left side of the mouth is followed by a gush of saliva from the duct of the left parotid gland, no saliva can be drawn from the right parotid duct by similar application, nor by applying the vinegar to any portion whatsoever of the buccal mucous membrane. I could not observe any difference in the behaviour of the two submaxillary glands, but the difference between the two parotids was as marked as it is possible for a thing of the kind to be.]