A CASE OF PARALYSIS OF THE TRIFACIAL NERVE: WITH REMARKS.

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PARALYSIS of both portions of the trigeminal nerve, uncomplicated by other nervous or cerebral symptoms, is, I think, of sufficiently rare occurrence to justify the placing on record the following interesting case, which I have had the good fortune to observe.

In the ordinary text-books of medicine, paralyzes of particular nerves, if not entirely ignored, are dealt with in a very cursory manner; and even in the works devoted especially to nervous pathology they are treated in but a little better manner.

Professor Erb, in his recent masterly treatise on Diseases of the Peripheral Cerebro-Spinal Nerves (Ziemssen's *Cyclopadia*, vol. xi), describes lesions of the fifth nerve as they affect the sensory and motor portions separately, and only hints at the possibility of a combination of paralysis of both roots.

Flint bears testimony to the rarity of lesions of this nerve, and remarks: "Complete paralysis of this nerve from disease is extremely rare" (*Practice of Medicine*, p. 635): an observation which is reiterated by most other clinical observers.

As far back as the year 1822, Fœdéra and Herbert Mayo demonstrated that section of the fifth nerve within the cranial cavity was followed by anæsthesia of the face.

Magendie* and Valentini† showed that the nutritive changes were most visible in the eye, and that they resulted in ulceration of the cornea and the exudation of pus and granular corpuscles into the anterior chamber.

Vulpian has demonstrated (*Gazette Hebdomadaire*, July 4th, 1873), by section of the trigeminal nerve in rabbits, that not only does the cornea become congested, but after a time it is the seat of calcareous formation, and there is a deposit of calcareous salts. So this nerve would appear to exert some special trophic influence over the eyeball, and the cornea in particular. I cannot agree with Dr. N. Fener,‡ who considers that this nerve has no influence over the nutrition of the cornea, and that the ulceration, etc., is merely the consequence of mechanical irritation due to want of movement of the lids, mummification and dryness of the eyeball, etc.

Bell§ has shown that, when the root of the fifth nerve is exposed and irritated in an ass, "the jaws closed with a snap"; and also, this nerve being divided, "the jaw fell relaxed and powerless".

CASE.—Catherine C., aged 37, a tailor's wife, was admitted to the West Derby Union Hospital on March 5th, 1878.

Previous Medical History.—When a child, she had small-pox. About fourteen years before she came under observation, her nose was injured by a blow. Ten years before admission, she had an injury to the left parietal eminence, the precise nature and effects of which I could not discover. Her "left eye had been bad for six or seven weeks", during which time she attended the Eye and Ear Infirmary in Mount Pleasant. She had been exposed a good deal to the weather latterly. About seven days before I saw her, she was suddenly seized with "giddiness in her head", and numbness and loss of sensation in the left side of the face. In her own words, "'T was in bed I took it; and, when I rose up in bed, the place was going all round". I could obtain no history of syphilis from the patient, although I am inclined to think that she may have been affected at some time with that disease. She had acute rheumatism once or twice.

I. *General Condition.*—Her skin was loose and flabby. She was anæmic-looking, slightly pitted with the scars of small-pox. The left side of the face was fixed and mask-like. There was depression of the left angle of the mouth. The heart, lungs, and abdominal viscera were apparently healthy and their functions normal. She complained of giddiness, and she staggered a little in her gait. Her intelligence was good. She had occasional pain in the head, especially in the left occipital region.

II. *Condition of Skin and Mucous Membranes of Left Side of Face, Mouth, etc.*—1. There was anæsthesia of the left side of the face, and of the scalp as far back as a line drawn across the top of the head from ear to ear. This loss of sensibility was accurately bounded by the middle line from the vertex to the top of the chin, and by the horizontal ramus of the lower jaw. The left ear was also more or less

anæsthetic. The anæsthesia was not so absolute in an area bounded in front by a line running from the malar prominence downwards and backwards to the neighbourhood of the angle of the jaw, above by the zygoma, and posteriorly by the ear. The sensation was tested by various methods—pinches, pricks, the temperature of boiling water and of ice—and was found to be entirely absent, except in the area indicated above, and here even there was but the merest trace. A grooved exploring needle driven through the entire thickness of the skin caused no sensation whatever. This proceeding was frequently repeated on various occasions, but always with the same results. It was curious to note the exact boundary of the anæsthesia by the mesian line, the slightest transgression of which in our experimentation was immediately indicated by the exclamations and wincing of the patient.

2. The mucous membrane of the left nostril was insensible to tickling and pungent odour; and there was a mucous discharge, more profuse than on the other side and rather offensive.

3. The conjunctiva and cornea of the left eye were quite insensible and could be touched with impunity. The palpebral conjunctivæ, I need scarcely add, were in the same condition; they were also much injected. Vessels crossed the cornea, and there was in its lower segment a small superficial ulcer; its upper part was quite opaque. The ulceration gradually extended, and on April 17th the whole extent of the cornea was occupied by an ulcer with well and sharply defined edges. At this time, the conjunctivæ also were in a much more inflamed condition.

4. The mucous lining of the upper and lower lips, and of the inside of the cheek, had quite lost the power of appreciating irritations of various kinds. This was also the case with the gums. On April 17th, there were abrasions on the inside of the left upper and lower lips, and on the buccal mucous membrane; and the patient informed me that there was occasional slight hæmorrhage from the gums on this side, which were spongy. The left side of the tongue, the palate, and velum palati, were anæsthetic.

III. *Condition of the Special Senses of Vision, Smell, Taste, and Hearing.*—1. As regards vision, when the patient first came under observation, sight in the left eye was much affected, she being only able to distinguish objects dimly through the upper segment of the cornea. As the corneal lesion extended, of course the perception of external objects by the eye gradually became less and less, till at length she could only perceive light, and that with difficulty. It is quite unnecessary to look for any changes of the retina or optic nerve to account for this, as the condition of the cornea, and possibly also of the contents of the anterior chamber, is quite sufficient to account for it.

2. The olfactory sense was affected, but I think only so far as the filaments of the fifth nerve were rendered insensible. It was difficult to determine accurately the exact state of affairs.

3. Taste was tested by various acid substances placed on the tongue, and certainly it was blunted, if not entirely lost, in the anterior part of the left side of this organ.

4. Hearing was much enfeebled on the affected side. The patient could scarcely hear the ticking of a watch when applied to the left ear; and she said that, when she lay on her right side, she could not hear people speaking to her.

IV. *Condition of Muscles.*—The left eye could not be closed as tightly as the right. This was probably owing to loss of sensation, and not to paralysis of the orbicularis palpebrarum. She could not chew with the left side of the mouth, and, as she said herself, "it is like as if I had no hold in my teeth on this side". This probably depended as much on loss of sensation in the teeth, etc., as on paralysis of the muscles of mastication. When the lower jaw was moved up and down, as in chewing, the muscles supplied by the motor portion of the trifacial nerve felt quite flaccid and inactive, as compared with their fellows of the opposite side. The inferior maxilla could be moved to the normal extent laterally towards the left side, but could not be moved towards the right at all, showing that there was paralysis of the left pterygoid muscles. Saliva and fluids trickled from the left angle of the mouth, without the patient being aware of it.

Through the kindness of my successor at the hospital, Mr. Deacon, I saw the patient on April 24th. She looked much better, and her condition was improved in every respect. Sensation was returning to the anæsthetic parts, and she could feel faintly now where she had no sensation whatever before. The left eye was not so much inflamed, and the ulcer of the cornea seemed to be healing. The muscles of mastication, however, were yet paralysed. There were some abrasions on the lips, etc.

On May 7th, I saw the patient. She looked much improved. The left side of the face was not so vacant-looking. Sensation was slowly returning to the anæsthetic parts. The ulcer of the cornea had healed up (and, I would remark here, the healing process proceeded from

* De l'influence de la cinquième Paire de Nerfs sur la Nutrition et les Fonctions de l'œil, in *Journ. de Physiol. Expér. et Pathol.*, vol. iv, p. 176.

† De Functionibus Nervi Cerebralis, p. 157, vol. v.

‡ Sitzungsberichte der Kaiserliche Akademie, June and July, 1876.

§ The Nervous System of the Human Body, 1830, p. 104.

below upwards: that is, from the part first affected to that last). There was left in the cornea an universal thick projecting opacity. The conjunctivæ were still injected and insensible. The masticatory muscles seemed to be regaining their power. The inferior maxilla could now be moved to a slight extent towards the right side, showing some return of power in the pterygoids. The abrasions on the buccal mucous membrane were healing, as also the sponginess of the gums. *Hearing was improved.*

The patient took her discharge on May 9th, contrary to the advice of the medical officer, and much to my annoyance. I think it by no means improbable, had she remained in hospital, that, under the continued use of iodide of potassium, proper hygienic means, and good unstimulating diet, she would have improved still more, if not have been cured altogether; but I fear that, returning to her old habits—and those, I am inclined to think, neither very temperate nor moral—her symptoms will retrograde, and possibly at some future date she may be admitted to some hospital in a worse condition than at first.

REMARKS.—The case I have just related is one of very great interest, and by no means of common occurrence. We could not have a more complete and accurate exposition of the functions and distribution of the trigeminal nerve, as proved by the results of experimental physiology and clinical observation. It shows, in a remarkably clear manner, the influence this nerve exerts, directly or indirectly, over several of the special senses, viz., of vision, hearing, taste, and smell, all these being more or less implicated.

As far as my researches have extended into the literature of the subject, I have been able to find but very few undoubted cases of lesion of both portions of this nerve, uncomplicated by symptoms of encephalic disease, or the implication of other nerves.

When we consider the symptoms of the present case, and bring to bear on them the anatomical distribution of the trigeminal, the evidence derivable from experimental physiology, from pathological research, and from careful clinical observation of the various authorities I have quoted above, there remains no manner of doubt concerning the nerve affected, and the absolute localisation of the lesion to it alone.

On the first glance I had of the patient, from the mask-like appearance of the left side of the face, I was inclined to regard the case as one of "Bell's paralysis", but when I observed the condition of the cornea and examined the state of sensibility of the face, etc., the delusion was dispelled, and there was no difficulty in assigning the lesion to its proper category. On further investigation, it became quite clear that not only the sensory branches were paralysed, but also the motor portion shared a like fate. The lesion (whatever may be its nature) which produced the symptoms, I imagine to be situated somewhere along the course of the nerve between the pons and the ganglion of Gasser, or possibly involving this structure. It implicates the motor and the sensory roots; and on this account I am inclined to place it somewhere along the course of the nerve between the pons and the ganglion. The fact of the symptoms being confined to this nerve goes far towards excluding the supposition of a central pathological change causing them. A lesion situated in the medulla oblongata, the floor of the fourth ventricle, the crus cerebelli, or in the pons Varolii, would produce symptoms, graver, more diffused, and involving the functions of other nerves, except, indeed, it were strictly limited to the nuclei of this particular nerve, or confined accurately to some part of its course, before its exit from the encephalon. It is difficult to imagine a central lesion of such very limited extent as not to produce other symptoms as evidence of its existence. Caries, or some other diseased condition of that portion of the base of the skull in which are situated the foramina through which the several branches pass, may exist, so as to constrict or otherwise disorganise the nervous trunks, and thus produce the paralysis. I am inclined to think that the cause is a syphiloma or other small tumour, probably situated at that part of the dura mater pierced by the trunks before they reach the summit of the petrous portion of the temporal bone, or else some inflammatory process or other degeneration of the neurilemma behind the ganglion, or surrounding this body. Taking into account the general improvement of the patient's condition under the use of iodide of potassium, and the absence of symptoms of paralytic affections of other nerves, I am certainly in favour of the syphilitic theory.

It will have been noticed that the eye was the first to indicate the occurrence of disease within the cranium. This is probably owing to the more acute sensibility and less power of resistance to external irritants of this organ than the other parts to which the trifacial is distributed, thus acting, as it were, as a very delicate test for prognosticating the future of a given case, but one by no means applicable to every case, and difficult of a direct interpretation. However, if in any case of sloughing cornea, the common symptoms of this affection, viz., pain, lacrymation, intense sensibility of the conjunctiva (both ocular and

palpebral), photophobia, etc., were replaced by absence of pain, dryness of the eyeball, anæsthesia, and tolerance of light, I would say, in nautical phraseology, "Keep your weather eye open", and "look out for squalls" in the direction of the area of distribution of the trigeminal. Bearing on this part of our subject, Marshall Hall observes (*Lectures on the Nervous System and its Diseases*, 1836, p. 31): "If the sensation of the face be lost by paralysis, arising from disease of the brain, the eye is safe; but if the same event occur from compression or destruction of the fifth (nerve) within the cranium, by disease, or in an experiment, the eye ceases to be nourished, and becomes destroyed! In the former case, the nerve of sensation only has suffered; in the latter, the nerve of nutrition, as well as sensation, has been involved in the disease or injury."

An interesting symptom is the deafness on the affected side, and one which may possibly be explained when we have regard to the part the trifacial nerve plays in the special sense of hearing. The tensor tympani muscle derives its nervous supply through the lesser petrosal nerve—a twig from the otic ganglion. Now, the action of this muscle, as its name implies, is to render tense the tympanic membrane, "thus enabling it to vibrate in reciprocation to sounds having a great variety of fundamental notes. It appears to be antagonised by the stapedius, the contraction of which seems to diminish the tension of the membrana tympani, and to take off pressure from the fluid of the labyrinth."

In the present instance, the tensor tympani must be paralysed, and, in consequence, the sound-waves fall upon a lax insufficiently vibrating membrane. This laxity is doubtless further increased by the action of the stapedius muscle, which is antagonistic; and being in full and unopposed working order, thus contributes in no small degree to the loss of equilibration. The accumulation of mucus in the tympanic cavity may also assist, to no inconsiderable extent, to blunt the sense of hearing; such accumulation being favoured by the paralysis of the circumflexus or tensor palati muscle, whose nervous supply is derived from the otic ganglion.

The loss of power in the muscles of mastication was a condition which could not be mistaken; this perhaps was more evident in the case of the pterygoids than of the masseter and temporal, because its effects were more manifest. In testing the action of the muscles, I had the kind assistance of Dr. Pollard, who manifested much interest in the case, and corroborated my observations on the other paralytic phenomena.

The fixed and mask-like appearance of the affected side at first was calculated to make one believe that there was paresis of the facial nerve; but, on further investigation, the action of the facial muscles was found to be intact. This, as well as the depression of the angle of the mouth, I think, can be satisfactorily explained by the partial paralysis of the buccinator (the muscle being supplied by the fifth and facial nerves), and the falling of the jaw from want of support of the masticatory muscles. This condition is graphically described by Dr. Althaus, in his case of bilateral paralysis of this nerve quoted above. In a former part of this paper, I have drawn attention to the experiment of Bell on an ass, in which, after section of this nerve, the jaw "fell relaxed and powerless". Thus I hope I have proved that a "fixed and mask-like appearance" of the face may exist, in some cases at least, without any lesion whatever of the portio dura.

P U E R P E R A L S C A R L A T I N A.

By V. STONE, F.R.C.S. Ed., Laurence Kirk.

ON May 9th last, Mrs. A. B., primipara, a member of my own household, was delivered of a male child at 9 A.M. The forceps was used, as the head was inclined to stick at the bony outlet; otherwise the labour was natural. The patient went on well till about 5 P.M. on the following day, when she became sick, and vomited, and felt very ill. When I came in about 8 P.M. (having left her perfectly well in the afternoon), I found her pulse 120, and skin burning hot; she complained of severe headache; no other symptoms. I washed out the vagina and uterus freely with diluted Condyl's fluid (having carefully examined for any bit of membrane, or anything likely to give rise to irritation, and failed to find anything), and repeated the washing every four hours. The patient passed a restless night, and next morning complained of sore throat. In the full daylight, I discovered an eruption on the neck and chest, the face being very red. I at once suspected scarlatina, as it was epidemic at the time, and I had been attending several cases. I requested my friend Dr. Johnston of Fordoun to see the case, and he, without being told of my suspicion or of the existence of an epidemic, expressed his opinion that it would turn out to be scarlatina. The patient was given