ON A CASE
OF
DOUBLE FACIAL PALSY,
WITH OBSERVATIONS ON THE
PHYSIOLOGY OF THE NERVES SUPPLYING THE FORE
PART OF THE TONGUE.

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IN the fifty-second volume of the 'Transactions' of this Society a case is recorded by Julius Althaus, M.D., of complete loss of function of the whole fifth pair of cerebral nerves unaccompanied by any other affection of cerebral or nervous matter. The case, as the author of it observed, afforded an excellent opportunity of thoroughly investigating the functions of the trifacial nerve with special regard to certain points still involved in obscurity. The case which I have now to record is an analogous case of complete loss of function of the portio dura of the seventh pair of nerves, also unaccompanied by any other affection of cerebral or nervous matter. These two cases may be regarded as completely supplementary to each other, and appear to me when

taken together to throw light especially on the functions of the chorda tympani.

Joseph D—, an intelligent young man, 24 years of age, was admitted to Dr. Steevens' Hospital, Dublin, on September 23rd, 1873. The first thing that attracted one's attention about him was that in speaking he could not pronounce the labial letters. On further examination it became clear that he was affected with paralysis of the portio dura of the seventh pair on both sides of the face.

History—He is by occupation a fireman in the employment of the Great Southern and Western Railway Company of Ireland; quite steady in his habits of life, and without previous syphilitic infection. Up to three weeks ago he was in the enjoyment of good health; the left side of the face then became affected, and one week later the right. The patient himself attributes his attack to wet and cold aggravated by his having been, at a moment when the weather was unusually cold for the season, transferred from an engine of the slow "goods train" to the much faster mail and express train.

His expression is remarkable, or rather his absolute want of expression. All the muscles of expression are palsied; he cannot smile or frown, blow, whistle, or raise his brows; he cannot shut his eyes or close his lips. All the symptoms of palsy of the portio dura of the seventh pair are equally well marked upon each side.

A careful examination was made of the condition of all the other nerves of the head, as it was feared, on account of its double character, that the facial palsy might have a central origin. The following was the result:

1st pair.—The sense of smell is quite normal.

2nd pair.—There is no disturbance of vision.

3rd pair.—There is no squint, and all the movements of the eyeball are perfect.

4th pair.—There is no evidence of any affection of the superior oblique muscle.

5th pair.—Feeling is normal everywhere over the skin of

the face ; in the tongue, touch and thermic impressions are perfectly perceived, *but he cannot taste on the forepart of the tongue*. The muscles supplied by the motor branches of the fifth appear unaffected. The patient can crack a nut between the molar teeth on either side with ease. There is no sign of palsy of the soft palate ; the movement of its muscles in attempting to produce guttural sounds when the mouth is wide open is strong and symmetrical.

6th pair.—The external rectus is absolutely unaffected.

7th pair.—The portio dura paralysed on each side, and none of the muscles of expression respond to even strong Faradisation ; the sense of hearing quite normal and equally good on each side.

8th pair.—The patient can taste on the base and back part of the tongue through the part supplied by the glosso-pharyngeal nerve.

9th pair.—All the motions of the tongue are perfect ; there is no difficulty in swallowing save that the lips cannot be closed in drinking, and he has to throw back his head like a hen when drinking.

The muscles of the face do not contract under the influence of Faradisation ; the effect of an interrupted voltaic current, however, is different.

October 30th.—On this day it was first observed that the corrugator supercilii muscles of the left side contracted during Faradisation, and slight twitching took place among the fibres of the orbicularis palpebrarum on the same side. On the right side of the face there is still not one single muscle which responds to Faradisation. There is a slight reappearance of voluntary motion in the left corrugator supercilii ; a slight but distinct contraction is to be observed when the patient endeavours to frown.

November 17th.—The patient left hospital to-day, but continues to attend twice a week as an out-patient. The muscles of the brow, corner of the mouth, and cheek are slowly but decidedly gaining power on the left side. There is as yet no sign of motor power returning on the right side in any one muscle.

January 1st, 1874.—Patient much improved on the left side of the face; right side also regaining motor power in the muscles of the mouth, but not as yet over those of the eyebrow and eyelid; the sense of taste still, as before, absent from the forepart of the tongue; general health and appearance good.

April 18th.—The patient was examined this day. The facial muscles may be now said to have regained their powers. He can shut both eyes, pronounce the labial letters, close his mouth, whistle, smile, frown, &c. The movements on the right side are not yet quite so perfect as on the left. The corrugator supercilii especially is more sluggish than on the left side. The sense of taste although returning in some degree, is still deficient in the forepart of the tongue.

On the 23rd December, 1874, I last saw this patient. The left side had recovered more perfectly than the right, although he has recovered power of expression, with a slight contraction observable upon the muscles of the right side, which are sluggish in their movements. A casual observer, however, would not now notice any traces of facial paralysis. The sense of taste in the forepart of the tongue is still obscure, and the secretion of saliva scanty on the application of sapid bodies to the forepart of the tongue.

It seems, therefore, that this case was one of double paralysis of the portio dura of the seventh pair accompanied with loss of the sense of taste in the anterior portion of the tongue. There is evidence, as clear and precise as clinical evidence can be, that no other nerves were engaged save those presiding over the motions of the facial muscles and the sense of taste in the anterior part of the tongue. The case being one the symptoms of which were remarkably neatly and well defined, and the patient himself very intelligent, it was possible to investigate some details with scrupulous care. The case was, in fact, free from many of the disturbing causes which tend to obscure observation and baffle all attempts to get positive and reliable facts.

Regarding the case as one in which there was no central lesion, but an uncomplicated palsy of the portio dura of the seventh pair, engaging also the chorda tympani, the following comparative observations were made with the view of determining the functions of the latter nerve :

His eyes being shut, the patient could detect the slightest touch on the forepart of the tongue. He could perceive a light touch with a feather, a camel's hair brush, or even a single hair, as well as I or any of the students present. He could with the tip of the tongue distinguish the double points of the æsthesiometer as well as any of us.

Two egg-cups being filled with water slightly differing in temperature, and, the eyes being closed, the tongue applied first to the one and then to the other, the patient could perceive without hesitation or mistake a difference not amounting to more than four or five degrees. Compared with myself and the students present the power of appreciating differences of temperature appeared normal.

The sense of taste was completely lost on the forepart of the tongue. The patient could not detect any difference between solutions of sugar, citric acid, salt, and quinine. Comparative trials were made in this way :—Solutions of the above substances were made in mucilage of gum, so that all were of uniform consistence. The words "sweet, sour, salt, bitter," and "cannot tell" were written on a slip of paper, and the patient directed, after the solution had been applied on the edges and forepart of the protruded tongue with a camel's hair brush, to reply by pointing to the answer without withdrawing the tongue into the mouth. His unfailing reply was to point to "cannot tell," while the rest of us, although occasionally requiring a moment or two, always answered correctly.

The patient could not perceive the electrical taste when the poles of a battery were applied on the forepart of the tongue.

The secretion of saliva excited by the application of sapid substances to the forepart of the tongue was in abeyance. The comparative observations made on this point were very

striking :—The patient and one of the students were placed sitting with their mouths open and their tongues raised towards the roof of the mouth, so that one could see in beneath the tongue within the incisor teeth ; a camel's hair brush dipped in lemon juice was then passed over the tip and edges of the tongue ; in the healthy individual, in less than half a minute, the hollow beneath the tongue became filled with saliva, which dribbled over the lip, while in the patient no saliva could be seen welling up.

The temperature within the mouth was normal.

In recording this case I wish to confine myself as closely as possible to the accurately observed symptoms. The chief interest of it lies in its comparison with Dr. Althaus's case already referred to. In his case ordinary sensation was lost in the tongue, while the sense of taste remained. He thus describes it :—"The mucous membrane of the mouth was completely anæsthetic as far as the gums, the tongue, the inner surface of the cheeks, and the hard palate were concerned. The tongue presented a most frightful spectacle, having been severely bitten and lacerated in every direction during the act of taking food, the patient being entirely unconscious of his biting the tongue whenever he did so. Some parts of the inner surface of the cheeks had also been bitten and were badly ulcerated. The sense of taste was not lost, for the patient tasted salt, sugar, and quinine on the front as well as on the back part of the tongue. Yet in the anterior part of that organ the perception of taste seemed to have lost its quickness, for while on my applying sapient substances to the posterior part of it the patient would at once exclaim 'bitter,' 'sweet,' 'salt,' he took about five or six seconds on the front part of the tongue to describe the taste, but he never made a single mistake there. He also perceived the galvanic taste of five cells of Daniell's battery, if applied directly to the tongue." In the case recorded by me ordinary sensation was unimpaired, but the sense of taste was lost. The two cases taken together go clearly to show that the so-called gustatory nerve is in reality a compound nerve, endowed with the sense of taste through the

fibres coming to it through the chorda tympani, while the ordinary sense of touch belongs really to the fifth pair. Upon the vexed question of the precise channel through which the taste-fibres enter the cranium, whether through the fifth, seventh, or glosso-pharyngeal, the case obviously throws no light. It will require further observations to clear up this obscure part of the subject.