A C A S E
OF
NEUROTOMY OF THE THIRD DIVISION
OF THE FIFTH NERVE
WHERE IT ISSUES FROM THE FORAMEN OVALE.

BY
J. BLAND SUTTON, F.R.C.S.,
ASSISTANT SURGEON TO THE MIDDLESEX HOSPITAL.

Received April 19th—Read December 13th, 1887.

THE fifth cranial nerve is notorious for the frequency with which its various branches are affected with neuralgia, and there can be little doubt, as Hyrtl points out, that the narrow bony passages through which the various branches of this nerve pass, explain this predisposition. To this we must add the exposed situation of its terminal branches and the intimate relation of some portions of its ramifications to the teeth and mouth.

Most of the branches belonging to the fifth nerve have been divided designedly by surgeons, either in superficial situations as at the supra- and infra-orbital foramina, or in such recesses as the speno-maxillary fossa and descending palatine canal. The speno-palatine ganglion has been attacked from its orbital aspect, as well as by hot wires

passed up the posterior palatine foramen. The lingual and inferior dental nerves have been divided from within the mouth, whilst the inferior dental nerve has been divided through a trephine hole in the inferior maxilla.

The present paper contains the details of a case in which I divided the third division of the fifth nerve at the spot where it issues from the foramen ovale.

George R—, æt. 64, came under my care in the Middlesex Hospital in August, 1886. He was suffering from a mass of epithelial cancer implicating the right side of his mouth, far too extensive to admit of removal. In addition to the suffering usually caused by this disease, his life was rendered more intolerable by sudden spasmodic seizures of pain, occurring sometimes as frequently as three times in five minutes. Indeed, the agony of this man was very distressing. Local applications of belladonna, aconitia, and subcutaneous injections of morphia were freely used. Although these anodynes removed the local discomfort, they were perfectly useless in subduing the spasmodic seizures.

An examination of the growth and the distribution of the pain led me to believe that, in all probability, the third division of the fifth nerve was implicated in the cancerous mass, and the only method of affording the desired relief would be to cut down upon the nerve as it issued from the cranium. The risks and difficulties of the proceeding were carefully considered and explained to the patient, but his only answer was, "Do anything to ease my pain."

On September 11th I raised up a flap from the right cheek immediately below the zygoma, and exposed the condyle and coronoid process of the lower jaw. With a trephine a circular portion of the ramus of the jaw was removed, involving one half of the neck of the condyle, and limited above by the sigmoid notch. This enabled me to pass my finger above the external pterygoid muscle, and, aided with a pair of forceps, the spheno-maxillary fissure was reached and the pulsations of the internal

maxillary artery distinctly felt. The cavity was now so deep that it accommodated the whole length of my index finger, and so dark that even by the aid of a benzoline reflecting lamp the nerve could not be recognised. With the finger the foramen ovale could easily be distinguished, and likewise the spine of the sphenoid bone. With a blunt-pointed bistoury the structures emerging from the foramen ovale were freely divided. Up to this point the hæmorrhage had been insignificant. On re-introducing the finger a tense band could be felt, and fearing it might be a branch of the nerve still uncut, it was divided. The result was a free and sudden gush of bright arterial blood. The cavity was too deep to admit of the hæmorrhage being controlled in the usual manner, so the forceps were abandoned and the wound plugged with a sponge, and the patient sent into the ward.

In the morning oozing still continued, and it was then deemed advisable to again attempt to find the artery. Chloroform was given, and on removing the sponges the blood poured out so freely that everyone thought the carotid was injured. The cavity was quickly plugged with a sponge, and I drew the man down in the bed, and there and then, tied the common carotid. This checked the bleeding, but still there was enough to make me feel uncomfortable. The wound in the cheek was therefore plugged with pieces of sponge sprinkled freely with tannic acid.

Next morning the patient was very comfortable, and stated that he was so free from pain, and to use his own expression, he "felt in heaven" compared to his previous condition.

On testing the sensibility of the affected side of the face I had the satisfaction of finding that the parts corresponding to the distribution of the lingual, buccal, and inferior dental nerves were anæsthetic. The region corresponding to the supply of the auriculo-temporal was not thoroughly insensible, but only benumbed. This led me to believe that the roots of the nerve had not been com-

pletely divided, and from an anatomical standpoint it can be readily understood that their escape is explained by the fact that they lie very close to the skull, and embrace the middle meningeal artery. The skin corresponding to the lower border of the inferior maxilla was only benumbed, and this is readily explained by the circumstance that, the transverse cervical nerve, from the superficial cervical plexus, frequently supplies the skin in this situation.

From the time of the operation to the day of his death my patient's condition was one of comparative comfort, and he never had another spasmodic seizure. The wound in the cheek slowly granulated and healed. The wound in the neck healed by first intention, but fourteen days later a small abscess formed over the ligature, which was of chromicized gut. This left for one month a sinus, but eventually it cicatrized soundly.

After the operation, the cancer in the cheek made very slow progress, and instead of frequent losses of blood from the mouth, the patient only saw streaks of blood at rare intervals.

Four months after the operation slight pain returned, and this I attributed to further extension of the growth; but on re-testing the tactile sensibility I suspected that the nerve ends were uniting. About a week later this suspicion was confirmed, for dull sensibility existed over the temples and cheek. This gradually increased, and at last appeared in the tip of the tongue, but never became very marked. With increased sensibility came also renewed pain, but no spasmodic seizures, and the aching pain was always easily controlled by belladonna applied externally, and at night by a morphia injection given to procure sleep.

The man lived on in comparative comfort until April 5th, 1887, eight months after the operation. During the last six weeks of his illness the cancer invaded the neck, and pressing on the cervical nerves rendered the more frequent use of morphia injections necessary. It also projected into the pharynx, and rendered deglutition

difficult, but the application of a 4 per cent. solution of cocaine overcame this trouble.

Notwithstanding all that had been done for this man, his friends would not allow me the parts I wanted, and it was with extreme difficulty that consent to examine the head could be obtained.

The Gasserian ganglion and the parts in the immediate neighbourhood were removed, and the right common carotid artery.

An examination of the parts at the foramen ovale was interesting. The nerve on quitting the skull immediately entered a mass of connective tissue in which was embedded the internal maxillary artery. On tracing this vessel it suddenly terminated in a *cul-de-sac*, its obliterated end being continuous with the connective tissue surrounding the nerve. The internal carotid artery was intact. It was impossible to distinguish the various fasciculi and trunks of the nerves with the naked eye. By cutting sections of the nerve and examining them microscopically, many cut ends of nerves were visible, most of which had undergone degenerative changes. Other nerves, to all appearances healthy, were easily made out, but the nerve-trunks, instead of being regularly arranged, were mixed in confusion.

With regard to the ligatured artery. The common carotid had been ligatured about an inch from the innominate. Above this point it was represented as a fibrous cord for half an inch, to which the vagus was firmly united. The artery above this spot was filled with firm clot, which extended two inches into the external and half an inch into the internal carotid trunk.

The above case seems worthy of record, partly on account of its novelty and partly on account of the difficulty encountered in the operation, but chiefly for the immense relief it afforded the patient.

Should I again attempt the operation I would open widely the mouth so as to get more room under the zygoma (this was impossible in the present case on account of the

tumour). Further, I should take the precaution to secure the internal maxillary artery as a preliminary, and aided by an electric lamp endeavour to cut a piece from the nerve instead of merely dividing it.

Possibly, however, many will regard the procedure as one scarcely within the sphere of legitimate surgical enterprise, but on the present occasion it was undertaken with the most earnest desire to relieve the patient's intolerable agony.

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' New Series, vol. ii, p. 316.)