on the testimony of the nursing staff. Certainly there has been some improvement in the length and intensity of the post-epileptic confusion, and this has been very pronounced in five cases. Only one patient in the series suffers to any great extent from minor fits, and these have shown a definite reduction since starting treatment.

Effect on Behaviour.—All the in-patients are severe psychotics of poor prognosis, who have been a constant source of worry to the nursing staff. The effect of the new treatment on their behaviour has been very interesting. Seven of them have shown no change, but in the others there has been a remarkable and welcome improvement. They are less irritable and quarrelsome, they are no longer liable to outbursts of violence, they have become less confused and more co-operative, and they are taking more interest in the ward and have become useful workers. One patient used to have frequent furors, but these have now ceased. One patient suffers from psychic equivalents which take the form of periods of aggressiveness and bad temper lasting several hours, and which are not controllable by means of drugs. Since starting E.C.T. five months ago he has had only one of these attacks, and this was immediately terminated by a single convulsion, induced as an emergency measure.

Complications

No severe or alarming complications have so far been experienced.

Increase in Frequency of Fits.—In four cases there was an increase in the frequency of fits on beginning the electrical treatment, but this did not last longer than the first month, and was followed by a reduction in number.

Increase in Confusion.—In a few cases the patients have gradually become more confused, especially when being given treatment twice weekly. This confusion always disappeared when the number of induced convulsions was subsequently decreased.

Discussion

Kalinowsky and Kennedy (1943) have reported on the value of artificial convulsions as a means of breaking up an epileptic cloudy state. During the course of their investigation on the electrical convulsive threshold of epileptics they were successful in keeping two patients free from fits for some months by induced convulsions, but were of the opinion that "no practical value can be attributed to such a procedure." Robinson (1943) has reported a case of psychosis of a schizophrenic type in an epileptic girl which was improved as a result of two short courses of E.C.T. Her fits were not decreased by the treatment.

Apart from these papers the literature contains no direct references to the value of E.C.T. in epilepsy. The idea of replacing epileptic fits by electrically induced convulsions as a therapeutic measure is therefore a new one; but the preliminary results of the present investigation show that it is not without promise, and that the method is one which merits further study.

A problem which immediately arises is that of choosing the right type of case for the treatment. The material on which the present study is based is obviously not very suitable, consisting as it does mainly of demented psychotics. It would be interesting to investigate the effect of the convulsions on more out-patients of the type of Case 1, especially those who show some definite rhythm in the periodicity of their fits. On the other hand, a treatment which helped to diminish the irritability and aggressiveness of epileptic psychotics would be very useful if criteria could be laid down as to the type of patient likely to benefit.

A second problem to be solved is whether the treatment has any lasting effect and so can be given in short courses, or whether its results are so transient that it must be given continuously as a form of "replacement therapy."

Many other problems present themselves for solution, and it is hoped that some of them may be made the subject of future communications.

Summary

The possibility is suggested of replacing epileptic fits, which may occur anywhere at any time, by convulsions electrically induced under controlled conditions of time and place.

The treatment of 15 cases of epilepsy by this method is described and a preliminary report is made on the results.

In 11 cases the fits have been materially diminished.

In 7 cases the symptoms of an associated psychosis have been ameliorated.

The value of an induced convulsion as a means of terminating a dangerous psychic equivalent has been illustrated.

No serious or alarming complications have been experienced.

My best thanks are due to Dr. N. Moulson, medical superintendent, for his help and advice; and to Mr. W. Place, Mr. L. J. Cole, and the male staff of Cefn Coed Hospital for their invaluable assistance.

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FRACTURES OF THE ZYGOMA BONE

BY

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Fractures of the zygoma or malar bone are always due to direct violence, the direction of violence determining the displacement. The bone is usually driven backwards and medially into the maxillary antrum and impacted there. The fracture is often comminuted and may have extension along the floor of the orbit into the orbital plate of the maxilla.

The zygomatic bone is a strong bone resting on four fragile supports, one or more of which are the sites of fracture, where it unites with: (1) The maxilla directly above the infraorbital foramen, the two bones forming the inferior orbital margin. (2) The zygomatic or lateral angular process of the frontal bone, forming the lateral margin of the orbit. (This margin is, in rare cases, cut by a second suture where the malar bone consists of two pieces—"mala bipartita" or "os japonicum" (Whitnall).) (3) The zygomatic process of the temporal bone forming the zygomatic arch. (4) The anterior wall of the maxillary antrum.

Diagnosis

Diagnosis can often be made at sight. Many or all of the following signs and symptoms are present: (1) "Black eye," subconjunctival haemorrhage; (2) unilateral epistaxis; (3) flattening of contour and lack of expression on the affected side (depression may be masked by oedema and ecchymosis); (4) irregularity and depression of the inferior orbital margin, or zygomatic arch just anterior to the ear; (5) pain and tenderness over one or more of supports previously mentioned; (6) pain on and difficulty in mastication; (7) numbness in the region supplied by the infraorbital nerve; (8) mobility and crepitus usually absent.

Confirmation is made by radiographs, the chin-nose position being the most suitable in our experience; this reproduces the orbital margins and any irregularity very clearly, although Stone recommends a mento-vertex view, which shows up the zygomatic arch and any inward displacement of the zygoma. The degree of violence may be almost insignificant and the fracture missed.

Complications

Ocular.—Persistent and vertical diplopia, due to (a) lack of support of the floor of the orbit, or (b) damage to the ligament of Lockwood (ligamentum suspensorium oculi), the eyeball being displaced downwards, with consequent hypotropia or hypophoria, or (c) orbital haemorrhage and organization of the clot interfering with the action of the inferior oblique and inferior rectus muscles, or (d) injury to the nerve supply of these muscles.

Nasal.—Infected haematoma of the maxillary antrum necessitating drainage.

Others.—Permanent loss of sensation in the region supplied by the infraorbital nerve. Mechanical obstruction to jaw movements due to pressure of in-driven fragments of the zygoma in the coronoid process of the mandible.

Treatment

Early replacement of fragments is essential to ensure complete absence of complications. The method of choice we consider to be the Caldwell-Luc approach to the antrum through an incision in the gingival sulcus. The line of fracture or the comminuted fragments are visible in raising the cheek. All loose fragments should be removed and also the residual blood-clot. The impacted bone is freed and raised upwards and outwards and the inferior orbital margin reconstituted. The antrum is packed with gauze, impregnated with bipp, and the end brought through an opening into the inferior meatus. The incision in the mouth is closed. The pack is removed in five days and the patient allowed home in 10 to 14 days.

Other Methods of Replacement.—(1) Gillies recommends an incision in the scalp above and anterior to the ear through skin and temporal fascia. A long, narrow, curved elevator is slid downwards behind the zygomatic arch and the bone elevated upwards and outwards. He admits that comminution requires the radical antrum approach. (2) Spaeth recommends pressure outwards on the lower part of the lateral orbital margin below the outer canthus. (3) Others recommend pressure from within the mouth or the use of hooked forceps through an external incision.

We do not think that enough power could be exercised in badly impacted cases using these methods. The ocular complications in untreated cases with vertical diplopia may be dealt with by suitable operations on one or more of the extrinsic ocular muscles, usually a weakening of the action of the contralateral synergist, with subsequent orthoptic treatment if required. As a last resort, prismatic lenses to restore the muscle balance may be prescribed. Where the antrum has been opened and drained no subsequent complication has followed in our cases.

Case Histories

Case 1.—A. S., aged 18. 10/7/42: Fell off motor-cycle; severely injured. Fractured right zygoma missed. 1/10/42: Vertical diplopia; impaired action of right inf. oblique; 24 prism dioptres hyperphoria; left eye higher than right (L./R. 24Δ. 8/10/42: Operation—recession of left sup. rect. muscle. Three weeks later still some diplopia. 16/11/42: Operation—myectomy of left inf. obl. 16/12/42: Hyperphoria L./R. 2Δ.; no diplopia; visual acuity, 6/6 R. and L.

Case 2.—W. T. (59). Knocked down by motor-car, 2/10/42. 13/12/42: Diplopia looking up; fractured left zygoma; impaired action of left inf. obl.; hyperphoria R./L. 16Δ. 17/12/42: Operation—recession of right sup. rect. 19/1/43: R./L. 4Δ. No further operation desired. Slight diplopia corrected by prismatic lenses.

Case 3.—Mrs. D. (27). 10/3/42: Struck in right eye with fist. 17/3/42: Fractured right zygoma, confirmed by radiograph; fractures at infraorbital foramen and two of lateral wall of orbit, with downward displacement of inferior orbital margin. Treatment refused because of domestic complications. 10/6/43: Diplopia looking down (right inf. rect.), corrected by vertical prismatic lenses. 7/9/43: With glasses, no diplopia; orthophoric with Maddox rod.

Case 4.—T. S. (71). 4/4/43: Fell off bus. Examined 25/4/43: Diplopia down and slightly to left; numb feeling in cheek; epistaxis and subconjunctival haemorrhage at time of accident. Radiograph confirmed fractured zygoma. Reduction refused by patient. Diplopia corrected with 6 prisms vertically, divided between the two eyes. 17/7/43: No diplopia with glasses; prisms reduced to 4Δ; orthophoric with Maddox rod and wing tests. V.A., 6/6 R. and L.

Case 5.—Mrs. C. (54). 17/5/43: Fell in street, sustaining black eye and subconjunctival haemorrhage. Examined 25/5/43: Fractured left zygoma at infraorbital foramen, with depression of inferior orbital margin. Operation same day; bone easily raised into position and antrum packed. Patient discharged in 10 days. 20/6/43: Perfect position; still numbness of cheek. 17/7/43: V.A., 6/6 R. and L. No diplopia. Maddox rod and wing, orthophoric (no muscle imbalance).

Case 6.—D. M. (56). Struck by fist in right eye. 7/7/42: Several signs present; no displacement; fractured zygoma at infraorbital foramen. No treatment. 28/7/43: V.A., 6/9 R. and L. Maddox rod and wing, orthophoric.

Case 7.—W. F. (57). 10/9/43: Struck on side of face by fall of coal; usual signs present and fractured right zygoma. Impacted fragments disengaged and replaced. 22/9/43: Patient discharged from hospital. 20/11/43: V.A., with glasses, no prisms, 6/6 R. and L. Maddox rod and wing, orthophoric.

Case 8.—T. McA. (18). 3/10/43: Struck by hammer on side of face; usual signs and symptoms. Radiograph confirmed fractured

zygoma with extension into orbital plate of maxilla. 10/10/43: Operation revealed comminuted fracture of anterior wall of antrum; fragments removed and zygoma replaced in position. Patient discharged 14 days later. 16/1/44: Radiograph shows perfect alignment; no diplopia; orthophoric.

Case 9.—A. F. (62). 2/11/43: Fell off cycle on left side of face. Many of usual signs present; fractured left zygoma at infraorbital foramen; slight displacement. Operation—bone easily raised into position. Patient discharged in 10 days. 16/1/44: No diplopia; orthophoric.

Summary

Diagnosis and treatment of fractures of the zygomatic bone and its complications are dealt with.

Two cases were not seen early enough; complications treated by extraocular muscle operations.

Seven patients were seen soon after accident, two of whom refused operation; diplopia corrected with prismatic lenses.

Four cases had fractured bone replaced; no complications arose subsequently.

One case required no treatment.

Immediate operative treatment to restore the displacement is stressed. Several methods of reduction are mentioned; open operation by Caldwell-Luc approach is suggested as being the most suitable. Subsequent treatment, operative or optical, of the commonest complication—persistent diplopia—should be carried out at a later date if required.

No patients should be informed that "nothing can be done" for them.

SOLITARY DIVERTICULUM OF THE CAECUM

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The recent report by Dr. Hendtlass (1944) of a case of perforated solitary diverticulum of the caecum has drawn attention to this rare condition, which may be met with when operating for appendicitis. Unless one is aware of the condition it is apt to be mistaken for carcinoma or tuberculosis, and needlessly extensive and severe operations, such as herni-colectomy, may be performed (Grace, 1940).

In 1937 Bennett-Jones reviewed the literature, collecting 19 reported cases and adding 3 of his own. In none of these 22 cases were any associated diverticula of the rest of the colon demonstrated.

The cases appear to be of two types. (1) Congenital true diverticulum of the caecum is an elongated pouch usually arising near the ileo-caecal valve and resembling an extra appendix. (2) False solitary diverticulum of the caecum. This has to be distinguished from the simple non-specific ulcer of the caecum well described by J. R. Cameron (1939) as resembling a peptic ulcer in its pathology. The diverticulum is a definite pouch which may show an area of inflammation in its wall, whereas the ulcer is purely an ulcer without any pouch. From the practical point of view the differentiation is unimportant, for the treatment is the same. The diverticulum is "false" because it does not consist of all the coats of the caecum, as does the congenital type, but is a hernial protrusion of the mucosa and submucosa through the muscularis. This may be caused by pulsion or by traction.

The fact that the diverticulum is usually solitary suggests that it has a different aetiology from multiple diverticulosis of the colon and is against the cause being pulsion from within. I can trace only one case—that reported by Mr. Lawrence Able (1939), in which associated diverticulosis of the pelvic colon was found. Traction may be caused by contraction of the scar tissue of a healing non-specific ulcer of the caecum (cf. diverticula of the duodenum associated with scars of old peptic ulcers).

Three of the reported cases, as well as the one here recorded, were associated with calcified tuberculous mesenteric glands. It is possible that the contracture of scar tissue around these glands may cause the diverticulum by traction. One of the reported cases (Thomsen, 1935) actually showed calcified tissue in the caecal wall. Harold Edwards (1939) calls attention to the comparative youthfulness of these patients with solitary