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

BY

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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

diverticula of the caecum. Eleven of Bennett-Jones's 22 cases were below the age of 32, whereas of Edwards's 15 cases of diverticulosis elsewhere in the colon the average age was 55 years, the extremes being 38 and 75 years.

Treatment.—All that is necessary is to perform a local resection of the diverticulum and adjacent portion of the caecum. A catheter inserted into the caecum through the stump of the appendix, which is usually removed at the same time, is a simple precaution to relieve any tension on the suture line and allow the giving of fluids if necessary.

Case Report

A muscular but not at all obese bricklayer aged 48 was admitted to Lewisham Hospital on March 21, 1939. Two days before admission he began to have pains across the abdomen which settled in the R.I.F. He vomited once the day before admission. There was a history of a right inguinal hernia for three years. Two years ago he had vomiting and general abdominal pain for one week. During the last 18 months he had suffered from vague abdominal pain without any regular relation to meals. He was never completely free from this pain for more than a week. His weight had kept constant.

On admission he resembled a case of acute appendicitis, there being rigidity in the R.I.F., with deep tenderness over McBurney's point. Temperature 98.4° F.; pulse 88; respirations 22. Under general anaesthesia a gridiron incision was made. The appendix was long, contained three faecaliths, but was not inflamed or obstructed. A diverticulum of the infero-lateral aspect of the caecum admitted the tip of the index finger. It was inflamed and very thin at one part. Some calcified glands were seen in the ileo-caecal region. A wedge-shaped portion of caecum including the diverticulum was resected and the caecum sutured in two layers. The appendix was removed and a catheter tied into the caecum through the invaginated stump of the appendix. A corrugated rubber drain was inserted down to the site of resection.

The patient made an uninterrupted recovery. There was a very little faeces-stained discharge from the catheter. The corrugated drain was removed on the fourth day and the catheter on the tenth day. The wound was dry a few days later, and he was discharged home three weeks after admission.

A plain radiograph of his abdomen confirmed the presence of calcified glands in the right lower quadrant of the abdomen. A barium meal showed no diverticula elsewhere in the colon. The barium meal was repeated in March, 1940: again the whole colon appeared normal. He had no symptoms.

I am indebted to Prof. W. G. Barnard, then Director of the London County Council Histological Laboratory, for the excellent photomicrographs. He reported on the sections as follows:

"Purulent diverticulitis of caecum. The diverticulum is typical of the more common diverticula of colon. It is a hernial protrusion of mucosa and submucosa through the muscularis, and because of

FIG. 1.—Section through solitary diverticulum of caecum. The abrupt termination of the caecal muscular coats (M) on each side of the diverticulum is clearly shown.

this is called a false diverticulum, to distinguish it from a true diverticulum, which would have the addition of the muscular coats in its wall. In Fig. 1 the abrupt termination of the caecal muscular coats on each side of the diverticulum is clearly shown, as are the mucosa and submucosa composing the wall of the diverticulum. At

one side of the diverticulum the mucosa is missing, and here there is a purulent infiltration which has spread to the pericaecal fatty tissue (Fig. 2)."

FIG. 2.—High magnification of the area outlined in ink in Fig. 1, showing purulent inflammation.

Summary

A case of purulent inflammation in a solitary diverticulum of the caecum is reported. The aetiology of the condition is discussed and local excision is recommended as the best treatment.

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PENICILLIN AND FIBRINOLYSIS

BY

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Staph. pyogenes can produce an enzyme fibrinolysin or fibrinase which may dissolve the clot produced by its own coagulase activity (Gonzenbach and Uemura, 1916; Gengou, 1933; Reimer, 1936). Some strains are more active in fibrinolysis than others. This fibrinolysis is well seen on inoculating 0.2-ml. quantities of human citrated plasma (diluted 1:4) in 2 in. by 3/8 in. test-tubes with a large loopful of a 24-hour broth culture of a strongly fibrinolytic strain of *Staph. pyogenes*. After 3 hours' incubation the contents of the tubes

TABLE I.—Comparative Activity of Fibrinolytic and Afibrinolytic Strains of *Staph. pyogenes*

	Clot Present After 3 hrs.	Clot Present After 6 hrs.	Clot Present After 9 hrs.	Colour to Neutral Red Initially	Colour to Neutral Red After 9 hrs.
0.2 ml. plasma 1:4 inoculated with 1 loopful of a 24-hr. broth culture of a coagulase-positive fibrinolytic strain of <i>Staph. pyogenes</i>	++ ++	— —	— —	Yellow "	Pink "
0.2 ml. plasma 1:4 inoculated with 1 loopful of a 24-hr. broth culture of a coagulase-positive afibrinolytic strain of <i>Staph. pyogenes</i>	++ ++	++ ++	++ ++	" "	" "

NOTES ON TABLE I.—(1) Double results refer to duplicate experiments. (2) 0.02 ml. of 0.04% neutral red added to each tube. (3) ++ indicates coherent clot occupying major portion of contents of tube. + indicates some clot. — indicates absence of clot.

have solidified to a gel, but after further incubation for 3 to 6 hours the clot redissolves completely. These facts are illustrated in Table I, which compares the fibrinolytic activity of two strains—one strongly fibrinolytic, the other afibrinolytic.