0.4%, tissue mast cells 1.2%. The degenerate cells were not included in the differential count, but they often contained phagocytosed pigment and may have been chiefly reticulum cells.

In view of the suggested relationship between tissue mast cells and marrow aplasia (reviewed by Fadem, 1951), the possibility that the prolonged clotting-time might be due to hyperheparinaemia was considered, and it was found that the clotting-time could be returned to normal by the addition *in vitro* of a suitable quantity of protamine. Protamine sulphate was given intramuscularly to the patient in doses of 40 mg. four times daily for three days, but had no effect on the clotting-time, and was discontinued.

The haemoglobin level fell steadily at the rate of 1 g.% every five to seven days, and there were several severe epistaxes during the first two weeks after admission. A small abscess under the chin developed, and the cervical glands enlarged, but this was controlled by systemic penicillin. Small transfusions were given at frequent intervals, but no evidence of marrow activity was evinced. The leucocyte count fluctuated between 750 and 3,000 cells per c.mm., with neutrophils from 10 to 150 per c.mm. The platelets varied between 1,000 and 20,000 per c.mm.

On September 8 a course of A.C.T.H. was started, 100 mg. daily in divided doses being given for 10 days. No effect was produced on either the clinical condition or the haematological state.

On September 22 severe frontal headache developed, accompanied by nausea and vomiting. Slight neck rigidity and a small retinal haemorrhage in the right fundus occurred, but no other abnormalities were found in the central nervous system. Within 12 hours the breathing suddenly became stertorous and unconsciousness followed. Both pupils were contracted to pin-points and did not react to light. The arms were flaccid, but with tendon reflexes still present and equal. After a short period of coma the patient's respiration failed completely and he died.

Post-mortem Examination.—A large spreading haemorrhage was found extending throughout the left cerebellar hemisphere and breaking through on to the surface. The meninges appeared normal. There was evidence of sub-mucosal haemorrhage throughout the small intestine and in the renal pelvis and ureter on the right side. The haemopoietic marrow of the femur was completely replaced by yellowish fat, and the marrow of the sternum and vertebrae was also very pale and suggestive of hypoplasia. The spleen and liver were congested and gave a positive Prussian blue reaction. Histologically the bone marrow contained very few cellular elements, and these were mostly lymphocytes and normoblasts. The liver showed a few scattered areas of large droplet fatty change, but there was no sign of fibrosis. Apart from congestion and scattered haemorrhages there were no other striking abnormalities in any organs.

Discussion

This case history presents an unusual combination of facts. There is no doubt that the patient was exposed to T.N.T. and developed a toxic jaundice in 1943, that he was later subject to an occupational dermatitis of the hands after working with machine oils in 1950, and that he died in 1951 from an aplastic anaemia. The relationship between these episodes is largely a matter for conjecture. There seems to be no known association between exposure to oil and the development of haematological disorders, and it is difficult to believe that T.N.T. could still exert a delayed effect after eight years. The most likely explanation of the circumstances in the light of present knowledge is that the anaemia was a coincidental primary marrow aplasia, unconnected in any causal way with the toxic agent to which the patient had previously been subjected. It is not impossible, however, that other cases of long-delayed anaemia may have occurred after T.N.T. poisoning and been dismissed as coincidental primary disorders, and it is hoped that this report may stimulate publication of such case histories if they exist.

Summary

The case is reported of a patient who suffered from toxic jaundice after exposure to T.N.T. in 1943, who developed an oil dermatitis in 1950, and who died from aplastic anaemia in 1951.

The possible relationship between these episodes is discussed.

I am grateful to Sir Lionel Whitby, regius professor of physic in the University of Cambridge, for permission to report this case.

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HAEMOPHILIA WITH RESPIRATORY OBSTRUCTION

BY

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Among the more serious hazards of the haemophilic patient's life is haemorrhage into the tissues of the mouth, pharynx, and larynx. Fortunately, this seems to be an uncommon site for bleeding to occur; indeed, we have been able to trace only 14 cases in the literature since 1910. Of these, 11 suffered from respiratory obstruction of varying degree. A survey of the records of the Western Infirmary, Glasgow, makes us wonder, however, if this is not a more common complication of haemophilia than that number of published cases leads one to believe. During the period 1936–51 34 haemophiliacs were treated: as so often happens, many had to be admitted more than once with haemorrhages at different sites, the total number of episodes being 112. Three instances of oral bleeding each associated with respiratory obstruction were found, and it was noted that blood transfusion and other medical measures were enough to bring the condition under control.

The following report concerns another case which came under our care at the same hospital. The problem that confronted us was to decide how best to combat the threat of suffocation. It was the feeling of all who saw the patient that surgical intervention was imperative, and a relief incision was made under the chin. As we hope to show, however, the maintenance of a clear airway by means of an indwelling endotracheal tube was probably the measure that really saved the patient's life.

Case Report

A youth aged 16, a known haemophiliac, was admitted to hospital on September 11, 1951. On the previous day he had complained of pain and a swelling under his tongue, and the swelling had gradually increased in extent. No injury or sepsis had been present to account for the lesion, though one molar tooth was carious and roughened.

When first examined the patient was pale, anxious, and moderately cyanosed. There was gross bleeding into the tongue, which practically filled the buccal cavity, and the submandibular and submental regions were also much swollen. At first there was only a slight degree of respiratory embarrassment, though swallowing was very difficult and his speech was painful and almost unintelligible. A haemarthrosis of the left knee was also present. The temperature was 97.4° F. (36.3° C.), the pulse 105, and the respiratory rate 22. The blood pressure was 125/70. The haemoglobin was 13 g. %.

Shortly after his admission a transfusion of fresh blood was begun, but this appeared to have little immediate effect on the local condition. The coagulation time was not estimated before the transfusion. Within three hours of admission the condition had advanced to such an extent that speech and swallowing became impossible and respiratory stridor was pronounced. The tongue had turned a deep purple colour and lay immobile, projecting between the teeth. The gums were bleeding and the cervical swelling had extended uniformly around the neck down to the level of the hyoid bone. Crepitations were heard at both lung bases.

In order to give more immediate relief a wide-bore needle was inserted in the midline below the chin into the base of the tongue. This met with no success even though the needle was moved in different directions and planes. It was therefore decided to resort to the more radical procedure, which we now describe in detail.

Operative Treatment

Premedication in the form of atropine sulphate, 1/100 gr. (0.65 mg.), was administered intravenously into the drip tubing, 10 minutes being allowed for its action.

The mouth, nose, and throat were prepared by spraying and painting with 5 ml. of 2% amethocaine hydrochloride containing 7 minims (0.42 ml.) of adrenaline 1:1,000. A well-lubricated No. 6 Magill nasal tube mounted on a Magill suction T-piece was passed blindly through the left nostril into the trachea. This tube was well tolerated, the relief to respiration being immediate. General anaesthesia was then induced with 10 ml. of 5% thiopentone and continued with nitrous oxide and oxygen, using a trace of trichlorethylene.

A vertical midline submental incision $\frac{1}{2}$ in. (1.9 cm.) in length was made. The deep fascia was incised and the base of the tongue and both submandibular fossae were explored, using both dressing forceps and a finger, but no clot or localized collection of blood was found. It became obvious that the haemorrhage was interstitial in type.

The wound was temporarily packed with gauze soaked in a solution of "thrombin topical," which controlled, for the time being at least, the bleeding from the wound margins. Penicillin tablets were then inserted and a small wick of gauze was left in. After operation the endotracheal tube was left in place, the T-piece being securely strapped to the face with adhesive plaster. An endobronchial suction catheter was passed and a large quantity of watery mucus removed. The patient made a rapid recovery from anaesthesia.

Post-operative Course

It was decided that the endotracheal tube would be better left *in situ* until the danger of asphyxia had passed. To relieve the discomfort caused thereby 2% amethocaine was sprayed down the tube from time to time during the first day. A clear airway was ensured by the passage of an endobronchial catheter, and suction was applied every 15 minutes for the first few hours and whenever necessary during the next four days. Penicillin was administered parenterally to reduce further the risk of a pneumonic complication. The patient received in all 3 pints (1.7 litres) of blood followed by an intravenous glucose drip.

During the next 36 hours the tongue became even more swollen and the question of tracheotomy was reconsidered. Dr. Gavin Young, oto-rhino-laryngologist to the Western

Infirmery, was consulted, but he advised strongly against further surgical intervention. By the second day we decided that the endotracheal tube had been in long enough, but on its removal it immediately became apparent that the patient still required an artificial airway. Accordingly, a fresh tube was inserted, again through the nose, using the same anaesthetic technique. At the same time a Ryle tube was introduced via the mouth in order to replace the infusion therapy with a gastric milk drip. Crepitations persisted at the lung bases, but no more serious chest complication supervened. A persistent tachycardia of 140 to 160 a minute gave some anxiety. The submental wound continued to ooze for seven days. The coagulation time during the post-operative period remained about eight to nine minutes (capillary tube method).

By the fourth post-operative day the patient's condition was materially improved. The swelling of the tongue had diminished to a size which permitted the endotracheal tube to be replaced by a nasopharyngeal tube. With anaesthesia as before, a cut-down No. 6 Magill tube served the purpose, and it was placed so that its end lay just beyond the back of the tongue. Some eight hours later this too was removed, as the patient demonstrated his ability to breathe with the tube occluded.

Five days later he was given a further blood transfusion, consisting of 1 pint (570 ml.) of fresh blood and 1 pint (570 ml.) of packed red cells, since the haemoglobin level had fallen to 5.7 g. % and the red cells to 1,800,000 per c.mm. Thereafter convalescence progressed satisfactorily, and by the fifteenth day the swelling of the tongue and the floor of the mouth had completely subsided. He had also fully recovered his speech, which, incidentally, betrayed no hint of damage to the vocal cords.

It must be admitted that the haemarthrosis of the left knee received scant attention, though we are pleased to report that it had absorbed fully, without impairing function, by the time the patient left hospital.

Discussion

With this emergency it is a matter of surgical importance to know whether the haemorrhage is a localized collection of blood or a diffuse extravasation among the soft tissues of the mouth and throat. The case reported was an example of the latter type. The following also describe interstitial lesions: Lesné, Powilewicz, and Récamier (1921), Voit and Paus (1933), Endicott, Mitchell, and Qvist (1942), and Edmonds (1951). It is noted that Wintrobe (1946) and Davidson, Epstein, Miller, and Taylor (1949) merely refer to the formation of a haematoma. The paper by Endicott and his co-workers (1942) should be read for an appreciation of the anatomical aspects of the problem.

Early transfusion is obviously indicated and would appear to have provided adequate treatment in 6 of the 14 reported cases, as it also did in those which we found in the past records of our hospital. Of the remainder, seven received surgical attention. Six of these patients underwent tracheotomy, four of them dying (Lesné *et al.*; Voit and Paus; Endicott *et al.*; Edmonds). The two patients who recovered (Baird and Fox, 1943; Fox, Spencer, and Tocantins, 1946) caused considerable anxiety in the post-operative period, a major concern having been a persistent ooze from the tracheotomy wound. Troutt (1931) reported a case of a patient who recovered after a local incision of the tongue. In our case the incision that was made under the chin may have afforded an outlet for the blood and serum, but it is more likely, considering the nature of the lesion, that the exploration did more harm than good. It is questionable, in fact, whether or not surgical intervention is necessary in this condition.

We agree with the recommendation of Boyd (1950) that an attempt should be made to intubate the trachea before resorting to a tracheotomy or relief incisions. He chose the oral route in his case, and apparently to good effect. In our case the lingual swelling only just allowed the passage of a laryngeal swab carrier, and laryngoscopy would have

been impossible. Nasal intubation under local analgesia does not seem to be unduly difficult in these circumstances. The precaution was taken not to give thiopentone until the respiratory obstruction was overcome. Davidson *et al.* (1949) have stated that the local swelling tends to diminish in 24 to 36 hours. The critical phase in our case lasted four days, and no deleterious effects seemed to result from intubating the trachea for that period of time. There is no doubt that the absence of chest complications was largely due to the post-operative nursing care and to the assiduous bronchial toilet.

Summary

A case of respiratory obstruction in a haemophilic patient is described. This complication was due to a spontaneous interstitial haemorrhage into the tongue and the floor of the mouth. Three other cases from the same hospital are cited.

The management of the case reported consisted of blood transfusion, a submental incision, and nasotracheal intubation.

It would seem that intubation presents certain advantages over, and may be preferable to, tracheotomy in the treatment of this medical emergency. A Magill nasotracheal tube left in place for four days caused no obvious damage to the vocal cords.

We wish to thank Dr. J. A. W. McCluskie and Mr. E. G. Gerstenberg, in whose wards the patient was treated, for permission to publish this case.

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A CASE OF TALC GRANULOMA SIMULATING CARCINOMA

BY

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Post-operative complications arising from the use of talc as dusting powder for surgical rubber equipment were first described by Antopol (1933). Experimental talc granulomas were produced in dogs by Lichtman *et al.* (1946), and many cases of post-operative adhesions have been attributed to the use of talc in the last decade. Mackey and Gibson (1948) described a talc granuloma which was found 13 days after laparotomy. Walker (1948) reported a death from general peritonitis following small-bowel obstruction due to talc adhesions following the repair of strangulated femoral hernia. Swingle (1948) recorded another fatal case of post-operative intestinal obstruction due to talc adhesions. Ross and Lubitz (1949) reported a similar case. Postlethwait, Mason, and Morehead (1950) also reported seven cases of talc granuloma found partly in persistently draining post-operative sinuses, partly causing intestinal obstruction, and partly present in operation scars. Kidd and Wilson (1951) described a case of recurrent intestinal

obstruction following appendicectomy at which adhesions containing crystalline material were found under polarized light. The value of modified starch as a substitute for talc has been recommended by Graham and Jenkins (1952).

The following is a report of a case of talc granuloma combined with an old-standing diverticulitis of the sigmoid colon which simulated carcinoma.

Case Report

A married woman aged 63 attended the surgical out-patient clinic on October 2, 1951, with 15 years' history of vague abdominal discomfort, constipation, some recent loss of weight, and poor appetite. She had also lately suffered from frequency and some discomfort on defaecation, together with a constant bearing-down sensation and back-ache. Cholecystectomy for gall-stones had been performed in Liverpool in 1946.

On examination her appearance was that of a middle-aged rather obese woman in moderately good general condition. There was a suspicion of an ill-defined mass in the L.I.F. Rectal examination revealed a fairly large, fixed, slightly tender mass in the pouch of Douglas which seemed connected with the uterus and suggested a uterine fibroid. On vaginal examination the mass seemed to lie behind and to the left of the uterus. The patient was referred to the gynaecologist, and an examination under anaesthesia was carried out on October 9, when the above clinical findings were confirmed.

Operation.—On the same day a laparotomy was carried out and a tumour was found which apparently originated in the sigmoid colon and which was densely adherent to the uterus. The affected part of the sigmoid colon was mobilized fairly easily and a provisional diagnosis of either carcinoma or diverticulitis of the sigmoid colon, leading to the formation of an inflammatory mass with subacute obstruction, was made. The colon proximal to the tumour was greatly distended. In view of the subacute obstruction a transverse colostomy was carried out with the intention of resecting the affected part of the sigmoid colon at a later date. The patient was transferred to the general surgical ward, and the colostomy was opened on October 15.

Second Operation.—On October 31 the affected part of the sigmoid colon was resected with end-to-end anastomosis. No secondaries were found anywhere in the abdomen apart from enlarged glands in the immediate neighbourhood, which were easily included in the resection.

Convalescence was uneventful and the patient was discharged from hospital on November 29 to return at a later date for closure of her colostomy. A barium enema carried out on November 22 showed the barium flowing to the colostomy without delay. The x-ray report mentioned a few diverticula in the lower pelvic colon with some inflammatory changes.

Third Operation.—The patient was readmitted for closure of her colostomy, which was carried out on February 2, 1952, and she was discharged healed and having normal bowel actions on February 21. She has been seen in the surgical out-patient clinic repeatedly since, and her condition is quite satisfactory.

Pathology

The specimen consisted of 4 in. (10 cm.) of thickened sigmoid colon with 3 in. (7.5 cm.) of normal colon on each side, together with a sector of resected mesocolon which contained several enlarged glands in the immediate neighbourhood of the tumour-affected part of the colon. The macroscopic appearance of the tumour suggested either carcinoma or Crohn's disease. The part of the colon proximal to the tumour was hypertrophic and distended. The lumen of the affected part was considerably narrowed, but the mucosa of the entire specimen seemed intact. As a third possible diagnosis diverticulitis with peridiverticulitis