There is one well-known boxer who, when 15 years old, was caught by a punch on the chin in the first round of a fight. He went down for a short count, but regained his memory under a cold shower. He had to find out carefully what had happened. He heard that he had fought like a tiger and won through a technical knock-out in the third round. Since the fight was won ultimately there would be—as Winterstein and Guttman point out—no motive for forgetting it.

The automatic activity of epilepsy with subsequent amnesia is celebrated, and is commonly reputed to be capable of reaching a high level, although the activity that takes place is held to be marked by impulsiveness and by lack of apparent purpose. This, if true, contrasts with the cases of boxers who proceed to win their fight—that is, they display a high degree of purposive activity while in a state of disturbed consciousness following the

blow which ultimately produced amnesia. The importance of this observation suggests that in epilepsy also there may be purposive activity relating to the ordinary life, and that purposelessness is not an essential and indispensable mark of an act of automatism.

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CIRSOID ANEURYSM OF THE SCALP

BY

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A study of textbooks shows that unanimity of opinion as regards the classification of scalp aneurysms has not yet been reached, while the aetiology of certain of these aneurysms has not definitely been settled. In a textbook published in 1900 the following statement appears:

"Aneurysms of the scalp—that is, cylindrical, spindle-shaped, or sacculated dilatations of arteries—are most common in the region of the temporal artery after injury of the same by a cut, stab, or contusion. These traumatic aneurysms result from a gradual yielding of the thrombus formed on the inner wall of the vessel at the seat of injury, and of the surrounding loose connective tissue from the impulse of the blood wave until finally a sac is formed, the wall of which consists of the outermost layers of the thrombus, the surrounding soft parts, and the newly formed connective tissue. In the case of non-traumatic or true aneurysms the artery gradually increases in circumference as a result of chronic endarteritis, which weakens the walls of the vessel to such an extent that they gradually yield to the blood pressure. In case the artery and corresponding vein are wounded simultaneously, an arterio-venous aneurysm may result—that is, a communication between the artery and vein is established, in some cases through an intervening sac. Owing to the communication between the artery and vein, marked disturbances in the circulation result, with pulsating dilatations of the arterial and venous branches. Almost all arterio-venous aneurysms result from injuries. Bramann states that among 159 cases there were only nine which began spontaneously. When spontaneous, there is at first a gradual dilatation of the artery from chronic endarteritis; the dilated sac then becomes adherent to the vein, and finally the aneurysm breaks through either into the open or already obliterated vein.

"Another form of aneurysm is the cirroid aneurysm, in which a number of arteries and their capillaries become dilated, tortuous, and thickened. It usually develops from abnormal congenital conditions, and should really be classed among tumours. Less frequently it is acquired. At one time a distinction was made between cirroid aneurysm and anastomotic aneurysm, the former being a diffuse dilatation of already existing arterial branches, with perhaps their capillaries and veins, while the latter was looked upon more as a tumour resulting from the new formation of dilated and elongated arterial branches. But these two forms frequently have transition stages, so that a discrimination cannot be made between them. The region of the ear and temples is a favourite place for cirroid aneurysm. It seems to be common in women, in whom a tardy commencement of menstruation and frequent pregnancies are predisposing factors. The differential diagnosis between a cirroid and an arterio-venous aneurysm is sometimes difficult."

The older surgeons had great experience in the diagnosis of aneurysm, but I should imagine that even to them "the differential diagnosis between a cirroid and an arterio-venous aneurysm" must have been "somewhat difficult." In a textbook published in 1923³ we read as follows:

"Plexiform angioma—this rare form of angioma was formerly known by the names 'cirroid aneurysm' and 'aneurysm by anastomosis.' Although the vessels composing it are chiefly arterial, the veins and capillaries of the part may also partake in the production of the tumour, and thus the name 'arterial angioma,' which is sometimes applied to it, is not strictly accurate. The disease is most common in the scalp, especially in the distribution of the temporal and occipital arteries, and in the external ear. It consists of a mass of large, tortuous, intercommunicating, pulsating vessels, sometimes forming a mixed tumour extending over a considerable area. At the peripheral parts of the mass the normal arterial trunks are much enlarged, and can be traced into it. Accompanying the pulsation a loud bruit may be audible to the patient as well as to the observer. The whole tumour has a convoluted surface and a bluish colour; the overlying skin may also be naevoid, and in the scalp generally becomes hairless.

"Plexiform angioma usually develops gradually in young adults; it probably originates in a congenital naevus through an exaggerated formation of the enlarged and convoluted arterioles that sometimes form part of such a naevus. In other cases the disease has followed an injury."

This gives the impression that cirroid aneurysm is usually a congenital condition. Yet in 1906¹⁰ Berry had written: "It is well known that cirroid aneurysm commonly develops after injury. It seems reasonable to believe that an injury involving both artery and vein would readily allow arterial blood to be transmitted to the interior of the vein. The increased pressure would naturally cause distension of the thin-walled veins, and a tumour composed of dilated and tortuous veins would be formed." Florence Sabin in 1913 showed, on the other hand, that the development of the capillary field afforded opportunities for communications between arterioles and venules to persist.

A study of the more modern textbooks and periodicals available in this Colony leave one with the impression that the elaborate classifications mentioned or outlined must be extremely confusing to the student. The subject is admirably summarized by Henry Searby⁶ in the *Australian and New Zealand Journal of Surgery* (1931, i, No. 2). He writes:

"There thus appears to be considerable evidence that cirroid aneurysm, racemose aneurysm, aneurysm by anastomosis, and pulsating angioma should be regarded as due to the same cause as arterio-venous aneurysm—that is, an abnormal communication between the arterial and venous systems—and, further, that such abnormal communication may be

developmental or traumatic in origin. Because this communication in cirsoid aneurysm is between veins and arteries which, although small, contain blood at a pressure which is high compared with that in the veins, the condition is progressive because the arterial blood in the thin-walled veins causes a progressive dilatation. In the case of so-called simple angioma, and of naevi, the difference in pressure between the immediate pre-capillary arterioles and the immediate post-capillary venules is so slight that the vein wall withstands, for the most part, the pressure, and a balance is arrived at, so that the condition remains stationary."

Treatment

As with all surgical conditions difficult of eradication, various forms of treatment have had their advocates through the years. As late as 1900, pressure treatment by pads and springs was being used, although it was admitted that the most certain cure was excision. How to attain this ideal? Extirpation after central and peripheral ligation of the main artery and all the branches leaving the aneurysm (Antyllus) had been tried and found wanting.

Excision of a small cirsoid was, of course, simple, but the larger aneurysms presented a difficult problem. Pressure on the afferent vessels while tying off the tumour on all sides with catgut; ligation of the afferent artery—for example, the external carotid or each of its branches—and surrounding the tumour with multiple catgut ligatures passed through the skin and around the separate vessels; ignipuncture—that is, punctate cauterization with the fine point of a Paquelin thermo-cautery or galvano-cautery, and injections of alcohol with a hypodermic syringe; the employment of caustics and the injection of tincture of iodine, or of liquor ferri perchlor.; all these had been tried and found wanting in the great majority of cases, and, in the case of injections, dangerous. Multiple incisions at different sittings, and ligaturing of the vessels met with, had little better results. Even tying of the common carotid had been tried—a dangerous method, which had been followed by softening of the brain from embolism or from thrombosis of the cerebral arteries.

As far back as 1887 Bryant¹ of New York had reported a case, quoted in *Operations of Surgery*, by Jacobson and Rowlands, 1907.

"The patient, aged 24, had a well-defined pulsating tumour at the site of a healed scalp wound in front of the left ear. The trunk and branches of the temporal and occipital were concerned in the growth. As this was rapidly increasing, the left external carotid was tied with catgut about half an inch above its origin. Tying the lingual artery also provided a branchless portion of the external carotid about an inch in extent. The ascending pharyngeal was sought for, but not found. All pulsation was at once checked, and the growth was also reduced to about one-third of its previous size. The operation was antiseptic throughout, and when the dressings were changed for the first time in ten days a slight return of pulsation was noticed in the tumour. A month after operation pulsation, thrill, and bruit were nearly as strong as before, and it was decided to attack the tumour itself in preference to tying the occipital and temporal branches, or the right external carotid. The arterial circulation was admirably controlled by surrounding the head with two strong rubber bands, beneath which compresses were placed at the points of where arteries passed to supply the scalp.

"Dr. Bryant found on record eight other cases of ligation of the external carotid for the cure of aneurysmal tumours of the face and head, and parotid gland, in two of which both vessels were tied simultaneously. This latter procedure is not reported to have been successful in either case. Of a total of nine cases, only one, a traumatic aneurysm of the parotid, was cured by ligation alone."

Jacobson and Rowlands remark:

"Thus it would appear that local remedies—namely, excision and under-running, aided by ligation of the chief feeding arteries—are most likely to be successful in this disease, which so often baffles treatment. Ligation of the external carotid on one or both sides will fail, owing to the free collateral circulation, if tried by itself, even in recent traumatic cases without much general dilatation of the vessels. If used at all, it should be as an adjunct and a preliminary step to diminish the vascularity of the tumour before this is dealt with locally by the methods above indicated."

In a recent edition of a well-known textbook² the statement appears:

"The condition may be treated by excision or electrolysis. In excision the haemorrhage is controlled by a temporary interlocking stitch around the affected area and by separate ligation of the feeding trunks. In large tumours the bleeding is formidable. In many cases electrolysis is to be preferred. The positive pole is placed in the centre of the tumour, while the negative is introduced into the main affluents one after another."

A. Kerr³ describes a method of excision which he states "may be looked on as a combination of the usual way of dealing with tracks of ano-rectal fistulae and one of Matas's methods of endoaneurysmorrhaphy." He incises the aneurysm from the deep aspect after the scalp flap has been thrown down. It would appear that for over half a century little real advance was made in the treatment of this uncommon but distressing condition. Searby in 1931 and Kerr in 1933 described methods which promise to be successful even in extensive cirsoid aneurysms. Curiously enough Kerr does not mention Searby's article. The methods appear to me rather similar, but of the two I consider Searby's the safer and of greater ease in application.

Report of a Case

The following are the notes of a case eventually treated in this hospital successfully by the method described by Searby.

An East Indian woman, aged about 25, was admitted on April 26th, 1932, by a doctor who wrote that "the pulsating haematoma of the scalp" had followed an injury from a falling piece of wood some weeks before. Examination showed a pulsatile swelling in the region of supply of the superficial temporal artery, and continuing backwards into the field of the occipital. It extended upwards almost to the middle line, and forwards to an inch from the line of the hairy scalp. A bruit was audible over it. The patient complained of singing and buzzing noises in the head and of severe headaches; she begged for operation—a sign that she was in great suffering, for East Indians postpone the use of the scalpel as long as possible. There was no scalp wound and no scar. The skin over the swelling was not naevoid. She had a moderate degree of hookworm anaemia, and had roundworm ova in the stools.

First Operation.—Electrolysis was tried at four sittings, using a method described in the manual of Thompson, Miles, and Wilkie; little effect resulted. It has to be admitted that our apparatus was home-made and our experience of electrolysis in large blood tumours was not great.

Second Operation.—Ligation of the superficial temporal and branches of occipital was undertaken under local anaesthesia. Pulsation was felt to cease almost throughout the tumour on May 26th.

Third Operation.—On June 5th pulsation was almost as free as ever. Under local anaesthesia feeding vessels which could be felt were under-run with catgut through the skin; the pulsation was appreciably lessened. The patient felt so well that she demanded discharge, with the promise to return if symptoms returned. She was accordingly discharged on June 17th. She was shown at a meeting of the local Branch of the British Medical Association two weeks later; the tumour and pulsation were still appreciable, but the tumour was only about half its original size. Soon after the meeting I read

Searby's article on cirroid aneurysm, and lamented its late receipt.

Fourth Operation.—She was readmitted on November 23rd, 1933, with return of the noises and "feeling of rushing water" in the head, accompanied by severe attacks of headache. The tumour had almost regained its original size, with free pulsation. She readily consented to operation despite the previous failures. The operation was divided into two stages, as advised by Searby, the first being performed on November 27th under chloroform and ether. (Intratracheal ether administration is advisable with the head elevated, but we do not have the apparatus in this Colony.) The scalp was shaved before the operation, great care being taken to protect the

procedure taking some time; several vessels had to be under-run. (Searby uses silk, but I have found catgut reliable in scalp operations.) The vessels in the aneurysm flap were tied in like manner, and the clamp was removed. The vessels in the aneurysm could be plainly seen from the under aspect of the flap; they "had a diameter about that of an ordinary lead pencil, and were packed very closely together." All haemorrhage having been controlled, with the tourniquet off, several layers of gauze were taken from a bowl of normal saline at blood heat, lightly squeezed, and inserted between the scalp flap and the bone. Sterile gauze was placed over the flap, covered with a light layer of wool, and a firm bandage was applied. No sutures were used to hold the flap

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

FIG. 1.—Before operation; the aneurysm actually extended further towards the midline. Scars of first operation are visible.

FIG. 2.—Flap thrown down after incision down to bone; clamp at base to control haemorrhage until vessels at edge of flap are tied off; forceps controlling haemorrhage in main scalp.

FIG. 3.—Vessels tied off, haemostasis satisfactory.

FIG. 4.—Saline-soaked gauze pads inserted between flap and bone.

FIG. 5.—Ninety-six hours later; gauze removed and oedematous flap under-surface exposed, showing the thrombosed aneurysm; the thrombosed tissue is easily stripped from the skin, and the vessels tied off at the flap pedicle beyond which thrombosis has not extended.

FIG. 6.—Thrombosed tissue stripped; under-running vessels in pedicle beyond which thrombosis has not extended.

tumour from accidental incision. Iodine sterilization was employed. A stout rubber tube was applied round the skull, well down over the occiput posteriorly, including the ears at the sides so as to help the "grip," and above the supra-orbital margins anteriorly. Small rolls of used glove rubber were inserted beneath this tourniquet where the larger vessels could be felt pulsating. The tourniquet also held in place a double layer of sterile gauze soaked in rectified spirit. The incision was made through the gauze with a sharp scalpel just beyond the visible margin of the aneurysm; it extended almost to the midline above, and tapered to a width of almost three inches in the region of the auricle. Digital pressure by assistants controlled the bleeding on the central side, while the scalp flap, which included the aponeurosis, was rapidly thrown down and a gastro-enterostomy clamp was run across its base; fairly free haemorrhage occurred, despite the tourniquet, until the clamp was in position.

As the flap was being thrown down several vessels passing from it into the bone bled freely, and were tied off with fine catgut. The bone showed commencing erosion by the aneurysm. Forceps were now applied to the aponeurosis as the assistants finger by finger released pressure, and individual vessels were picked up and tied off with catgut—a

FIG. 7. — Photograph of healing wound on tenth day, after final operation.

in position. A gum saline injection was administered, as a good deal of blood was lost and the patient had been in a debilitated state. A blood donor who stood by was not required.

The second stage was performed ninety-six hours later. (Searby allowed an interval of seventy-two hours, but stated that he thought ninety-six hours would have been better.) Under general anaesthesia the dressings were removed. The flap was found to be oedematous but healthy, except at the edges, which showed a greenish-black colour as if decomposition was setting in; the odour was not marked. Stripping of the subcutaneous layer and aponeurosis from the skin was found to be easy. The stripped tissue included the thrombosed vessels of the aneurysm. At the base of the flap the vessels were not thrombosed, and were easily isolated and tied off with chromic gut. The thrombosed tissue was

thus easily cut away with very little bleeding. The flap edges were cut round and so freshened. The flap was then replaced and anchored by silkworm-gut stitches. Rubber glove drains were inserted at the pedicle, dressings were applied, and the head was firmly bandaged.

Healing followed by first intention, except where the drains had been inserted. (The use of these could, I think, be safely abandoned.) The patient complained of the head

being "sore" for three days, but the old headaches did not recur. She was discharged in two weeks, feeling very well and with no sign of tumour or pulsation.

Summary

1. The aetiology of cirroid aneurysm of the scalp does not appear to have been definitely settled.

2. A theory attractive to the practical surgeon is, that cirroid aneurysm, racemose aneurysm, the aneurysm of anastomosis, and the pulsating angioma are due, as is arterio-venous aneurysm, to an abnormal communication between the arterial and venous systems, and that such communication may be either developmental or traumatic in origin.

3. Even large cirroid aneurysms of the scalp may be extirpated by a method which depends for its success on the easy stripping of thrombosed and oedematous tissue, including the aneurysm, from the skin layer of the scalp flap.

4. Despite the fact that the vascular layer is stripped from the flap with the aneurysm, the skin flap receives sufficient nourishment, and very little sloughing takes place even with a large flap.

5. In the case described the whole aneurysm was excised. Searby, dealing with a larger aneurysm, excised only two-thirds of it, and the results were excellent, because the abnormal communication between the arterial and venous systems was abolished.

6. An interval of ninety-six hours between the two stages of the operation should not be exceeded, as necrosis of the flap edges might occur. An interval of seventy-two hours may not allow such easy stripping of the aponeurosis and thrombosed tissue from the skin flap. Probably an interval of eighty-four hours would be ideal.

7. The operation should not be a formidable one in practised hands, despite the vascularity of the scalp; haemorrhage will naturally be greater and the operation time will be longer if aneurysmal tissue has to be cut through.

8. It is unlikely that quinine and urethane injections, as have been lately used in the treatment of naevus, would be successful in the treatment of extensive pulsating tumours.

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The illustrations are by Alohihakau Eva, a student of the Central Native Medical School, Suva, Colony of Fiji.

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G. Murano (*La Pediatria*, June 1st, 1936, p. 521) records the case of a male infant, aged 18 months, who nine days after the onset of varicella developed a tremor in the right lower limb which rapidly became generalized. An intense horizontal nystagmus was also noted together with general muscular hypertonus and a slight exaggeration of the tendon reflexes. The cerebro-spinal fluid was normal. The nervous symptoms disappeared in twenty-five days, but about a fortnight later the child developed bronchopneumonia, and died after a week's illness. There was no necropsy. A history of repeated abortions in the maternal grandmother, the mental deficiency of the father, and the retarded psychical development and positive Wassermann reaction in the child are constitutional factors which may have reduced the child's resistance.

BLOOD TRANSFUSION

A REPORT OF SIX FATALITIES

BY

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This is a report of six fatalities following blood transfusion. Five of them occurred from heart failure, although ordinary precautions had been taken in the preliminary tests and in the performance of the operation. Death occurred, often with pulmonary oedema, but without evidence of haemolysis, from thirty minutes to nineteen hours after transfusion. These five cases form a group of which only few isolated examples have been reported; this, however, does not appear to be a true index of their incidence, for they were collected within a period of two and a half years at one hospital. Only two of these five were personally observed; in each of the other cases the notes were amplified by personal communication with the operators concerned.

The sixth case was clearly the result of incorrect grouping; haemolysis was evident, and death occurred from uraemia four days later. None of the cases was *in extremis* before transfusion; they can all, therefore, be fairly described as transfusion fatalities. A careful post-mortem examination was made in each case, and I am indebted to the late Professor Donaldson for reporting on the histological appearances.

Case I

Addison's Anaemia: Transfusion: Pulmonary Oedema: Death in Ten Hours

A woman aged 60 had had three operations many years previously for a pelvic condition. She was admitted to a surgical ward with a story of having had epigastric pain and vomiting and loss of weight for three years, and with weakness and dizziness of six months' duration. A test meal showed achlorhydria, and two x-ray examinations suggested a carcinoma of the pylorus; haematoporphyrin was present in the faeces. The haemoglobin was 30 per cent., but no further blood count was made. Laparotomy was decided upon.

The patient belonged to Group IV, and 300 c.cm. of blood from a relative (also Group IV) were given by the citrate method at 6.30 p.m. The patient's serum was tested against whole blood of the donor and no agglutination appeared. Shortly after completion of the operation she experienced a sense of fullness in the throat and shivered slightly. At 8 p.m. the pulse rose to 140 and the temperature to 100° F.; pulmonary oedema developed. Later, adrenaline and atropine were given; the patient became comatose and died at 5 a.m., ten hours after the transfusion.

Post-mortem Examination.—The stomach was normal; no carcinoma. The bases of the lungs were congested and oedematous; there was excess of frothy secretion in the trachea and bronchi. The heart showed excess of fat over the surface; the muscle was soft, and the right side was dilated. The liver was soft and deeply congested. The bone marrow of the humerus was deep red. The spleen was slightly enlarged and very deep red. The kidneys were normal and the arteries healthy. The urine was clear. The histological examination was as follows: Perles' reaction showed much iron in the liver, spleen, and kidneys; in the last-named there was slight cloudy swelling only. The spleen sinusoids were engorged with blood; normoblasts and megakaryoblasts were present, and a fairly large number of eosinophils. Iron was present in the central parts of the liver lobules, but there was no marked fatty change. There were focal reticulo-endothelial cell collections in the cardiac muscle, but no fibrosis and no fatty degeneration. The bone marrow showed a well-marked normoblastic and megaloblastic reaction; many eosinophils were seen.