On February 1st the muscles of the extremities were relaxed, though there were still occasional spasms of the muscles of the back. Only slight stiffness of the jaws now remained. She slept well this night.

From February 2nd to February 6th inclusive, I gave her a daily intravenous injection of 1,500 units of serum, as she still suffered from occasional spasms of the muscles of the back and thorax. I attended her last on February 8th, when she was completely free from spasm, could take a full diet, and was able to sit up.

The following are the chief points of interest in the case:—

(1). The intravenous mode is by far the best and quickest.

(2). Less serum is required for a good result by this than any other method.

(3). Despite the repeated intravenous administrations, there were no bad results.

The intravenous route is the one which should always be adopted for such cases.

A CASE OF ATRESIA OF THE VAGINA AND UTERUS.

By G. D. MADHOK, L.R.C.P. & S. (Edin), L.R.F.P. & S. (Glas.) L.M. (Dub.), D.P.H. & D.T.M. (Liverpool).

Jaffirbund, P. O., Cachar, Assam.

A GIRL aged 15 years sought advice for an abdominal tumour of one year's duration. She had never menstruated. The tumour was regular in outline and of a soft œdematous consistence. It gave a dull percussion note, was half-way to the umbilicus and slightly painful. By combined rectal and abdominal examination, the uterus could not be made out and the abdominal swelling was found to be incorporated with it. Hæmatometra was diagnosed and she consented to undergo an operation.

A vertical incision was made just below the external urethral meatus and the vagina was found to be well developed. There was no hæmatocolpos. The uterus was fixed to the vagina by a few adhesions and there was no evidence of the cervix. The uterus was set free and pulled down by a vulsellum. A small dimple at the position of the os was observed. A trocar was passed into the globular uterus and a large quantity of dark viscid fluid escaped. The vaginal portion of the posterior wall of the uterus was then incised vertically in the middle line, and to secure the permanent patency of the uterine canal, catgut sutures were introduced on each side in such a way as to fold the raw edges on each other. The vaginal incision was stitched up anteroposteriorly to permanently enlarge the orifice. The uterus and the vagina were loosely packed with gauze and the patient made a speedy recovery. When recently seen she was in perfect health and menstruating regularly.

SPECIAL ARTICLE.

REPORT ON THE SURGICAL WORK AT THE MADRAS GOVERNMENT GENERAL HOSPITAL, 1923.

By E. W. C. BRADFIELD, M.S., F.R.C.S., LIEUT.-COLONEL, I.M.S.,

First Surgeon, Madras Government General Hospital.

I. CANCER.

THE following tables show the admission for cancer into all the surgical wards of the hospital during the past five years.

Statistics for sarcoma are not included.

TABLE 1.

Number of admissions for cancer for the period of five years ending 1923, with results:—

—	1919.	1920.	1921.	1922.	1923.
Cured	31	18	20	22	29
Relieved	1	3	6	8	26
Otherwise discharged (Inoperable).	29	29	22	37	51
Died in Hospital ..	5	7	7	13	18
Total ..	66	57	55	80	124

TABLE 2.

The percentage of cancer among the different races to total admissions into hospital for the period of five years ending 1923, was as follows:—

—	Europeans.	Hindus.	Muhammadans.	Other castes.
Total admissions for the five years.	9,221	24,227	2,422	7,160
Total cancer for the five years.	36	288	23	35
Percentage for the five years.	0·37	1·19	0·95	0·48

TABLE 3.

Occurrence of cancer by site, race or caste, 1923:—

—	Hindus.	Europeans and Anglo-Indians.	Indian Christians.	Muhammadans.	Other castes.	Total.
Tongue and floor of mouth.	7	2	..	..	..	9
Jaws	13	..	..	1	2	16
Cheek	28	2	1	5	1	37
Lips	2	..	..	1	..	3
Breast	7	1	..	..	..	8
Penis	17	..	..	1	..	18
Uterus	1	..	..	..	..	1
Anus and rectum ..	2	1	..	..	1	4
Stomach	6	..	..	2	..	8
Intestines ..	4	..	..	..	..	4
Larynx	1	1	..	..	..	2
Oesophagus ..	1	2	1	..	..	4
Liver	2	..	..	..	1	3
Bladder	1	..	..	..	1	2
Skin	3	..	..	..	..	3
Other parts ..	3	..	..	..	..	3
Total ..	98	9	2	10	5	124

The tables are interesting, as giving a fair idea of the incidence of the disease in Madras, but are not complete since we are unable to include statistics from the out-patient department, where many inoperable cases, especially affecting the mouth, present themselves for treatment. Cancer would appear to be slightly more prevalent among Hindus than among other races and castes—(Table 2)—but this is due to the higher incidence among them of carcinoma of the mouth and of the penis, the most frequent sites for the disease in this Presidency. The low incidence among Europeans, and Anglo-Indians was unexpected, but is due to the same cause.

Cancer of the Mouth.—A rough examination of the mouths of hospital patients will reveal the fact that about 80 per cent. of them have infected teeth, and that quite a number, 8 to 10 per cent., exhibit patches of leukoplakia or chronic glossitis. These patches are found on the inside of the cheek, most frequently leading to the angle between the cheek and lower jaw and are in many cases a pre-cancerous condition. They occur among the poorer classes, a result of continuous betel chewing, a chronic irritation being produced by the coarse lime (*chunam*) with which the nut is mixed. When cancer supervenes, these areas become ulcerated. The disease spreads widely, rapidly, and insidiously in the submucous layer, in the buccinator muscle, whence it involves the periosteum of the upper and lower jaw, and occasionally spreads backwards towards the pterygoid region, this last being difficult to detect and an incident of very grave prognosis. The glands, submaxillary, and upper cervical, as a rule become infected late, though frequently enlarged and inflammed. Previous hospital reports have commented upon the numbers of patients presenting themselves in advanced stages of this disease, upon the high mortality which results from operation and upon the frequency with which recurrences are detected even before such patients can leave hospital. The condition of these patients is extremely distressing, they cannot open their mouths, which contain an ulcerating foul-smelling growth, absorption of septic material from which rapidly undermines their health, while its smell makes them a nuisance to their neighbours. They implore the surgeon to do something for their condition, often asserting that any risk is worth taking to rid them of their cancer, and undoubtedly a wide removal, even though some growth remains and will recur, will produce extraordinary relief. The gap in the cheek which is not closed allows free escape of the discharges, while the division of the nerves which necessarily occurs during the operation is a great factor in the resulting freedom from pain. We have tried injecting the Gasserian ganglion through the foramen ovale with alcohol in some of these advanced cancers, but the results have not been satisfactory.

The operations performed for cancer of the mouth during the year were:—

—	No. of cases.	Apparent complete removal.	Recurred.	Partial operation only.	Operation mortality.
Cancer of cheek (*Chunam* cancer)	8	3	4	1	Nil.
Cancer of cheek and lower jaw (*Chunam* cancer)	5	2	2	1	Nil.
Cancer of tongue ..	2	1	1	Nil.	Nil.
Cancer of floor of mouth ..	1	1	..	..	..

The average age of the *chunam* cancer cases was 44 years, the oldest being 64 and the youngest 35, while 7 were males and 6 women patients. Recurrence took place in the wound in 3 patients; in the pterygoid region, in 3 patients; in the lower jaw, 1 patient; and in the upper jaw, 1 patient.

At first sight these results are most discouraging, only mitigated by the knowledge that very great though temporary relief has been given in what is one of the most distressing of diseases. They bear out what has been the usual experience with these patients for some years and which has suggested that operative treatment holds out very little hope of cure in this type of cancer. "Follow up" efforts are notoriously difficult in India, but amongst the answers received from our recent attempt to trace all our 1922 patients, was one from a patient operated on for a moderately advanced cancer of the cheek 2½ years ago and who now reports himself perfectly well, a result which shows that this disease can be cured.

A record of 13 of these operations without a death, considering their known high mortality when the lower jaw is removed, and which in 1914 I reported as being as high as 42 per cent. in the women's wards over a period of several years, is evidence of that luck which sometimes follows a surgeon; but our routine method of procedure has had a considerable influence. It is often impossible to remove or clean up the teeth before operation and without splitting the cheek, but a preliminary laryngotomy reduces the risk of broncho-pneumonia and a preliminary injection of novocaine into the Gasserian ganglion, of shock; and enables us to operate with a minimum of general anæsthetic. Our later cases have all had the advantage of the diathermy cautery; and the results have so far been extremely encouraging. The cancer of floor of the mouth reported in the above table was a very advanced condition in a European, who was sent up from another province in the hope that something could be done. There was a large fungating growth involving the floor of the mouth, with its usual distressing accompaniments, and huge glands in the submental region. The growth on section proved to be a typical epithelioma. The tumour was very freely cauterised with the diathermic cautery on three occasions; the last occasion destroying part of the lower jaw, the necrosed area of which has only recently separated. His doctor now reports, "16 months ago this man had an inoperable carcinoma and to-day he is earning a living running two motor lorries, there is no sign of recurrence."

One patient had a hard epitheliomatous ulcer at the junction of the middle and posterior third of the tongue. After a preliminary operation to remove the glands and tie the lingual artery, the tongue was split along the anterior half, the removal completed with a diathermic cautery, and the area of the wound deeply cauterised. Satisfactory removal would have been impossible with knife or scissors, and the appearance after sloughs separated was excellent, though it is too early to say what the final result will be.

This method of surgical removal with the diathermic cautery is too well known to warrant description, but it appears to be especially suitable for malignant growths in the region of the mouth. In dealing with these *chunam* cancers, the most satisfactory procedure is to use a knife for removal of the growth with a wide margin and to include the glands of the submaxillary triangle where possible, the danger of shock having been averted by the free use of novocaine. The operation is then completed by a free diathermic cauterisation of the wound area using a button cautery, and paying special attention to the area leading to the pterygoid region. The sloughs which result from this treatment take 6 to 14 days to separate, but there is little or no smell and much less disturbance to the patient than would be expected. It is early to report the final results, but this method is far more promising than any others that we have attempted for these very malignant growths. We have obtained very little advantage from *x*-ray treatment in inoperable cases, but a series of regulated exposures is given after all these operations.

Cancer of the Penis.—This form of cancer is fairly common in Madras, and 8 operations were performed in my wards during the year with one death, a patient

aged 55, who died on the 13th day with advanced disease of both kidneys (pyonephrosis). The average age of these patients was 54 years, the oldest being 65 and the youngest 40; one patient was a Mussalman. Operative treatment gives very good results in this form of cancer and we were able in 1921 to trace patients who have remained well for several years. Of late, however, the necessity for removal of the inguinal glands has not been sufficiently impressed upon patients, an idea having grown up that the disease very rarely recurs. Recently our optimism in this respect has been rudely shaken, for two patients, one operated upon in another hospital and one in our own wards, presented themselves with large inoperable growths in the glands. It is difficult to remove the glands with the penis, for these are old patients often of poor operative risk and the danger of sepsis is considerable. For the same reason they are anxious to leave hospital as soon as the tumour has been removed and their wound healed. Removal of these glands at a first operation is the safest procedure, but there is always risk of sepsis in this area, especially in the presence of a fungating growth.

The results of operation for cancer of the penis are invariably good, but a note of warning is necessary as to this danger of recurrence in the inguinal glands.

Abscess of the Liver.—For some time now it has been the routine practice of this hospital to treat all cases of abscess of the liver by aspiration, followed by a course of emetine treatment. The result of these methods has been entirely satisfactory and a comparison of the results obtained during the 10 years 1912 to 1921 with those obtained during the past year is very instructive. During the former period of 10 years 171 patients were operated upon in the Ceneral Hospital for abscess of the liver, of whom 31 died, a mortality of 18.1 per cent. During the past year 33 patients were operated upon for abscess of the liver, of whom 2 died, a mortality of 6.3 per cent. These two patients who died, illustrate in the one a difficulty of diagnosis and in the other a warning necessary regarding this treatment. The former patient was admitted with symptoms which pointed entirely to a gastric condition. He complained of pain after food, had a tumour in the left side of the abdomen and was acutely ill. Laparotomy was performed and a large rounded tumour was discovered growing from the left lobe of the liver and fixed to the upper border of the stomach, which organ was small and almost hour-glass in shape. The tumour on aspiration proved to be an abscess. This patient followed the course which so often follows drainage of a liver abscess in a patient acutely ill. The abscess became septic and in spite of all efforts the patient died of septicæmia. A better treatment would have been to close the laparotomy wound and aspirate the abscess from behind.

The second patient was also admitted, acutely ill and with symptoms pointing to an abscess which had ruptured into the lung. He was aspirated on two occasions and was so improved in his condition that he declined further treatment and left the hospital. He returned to the hospital after two months again acutely ill and with a large septic empyema, which necessitated drainage and ended in death of the patient. There is no doubt whatever that treatment by aspiration is an enormous improvement on older methods and that with improved confidence in this treatment the first patient operated upon would probably have recovered with a suitable aspiration. The condition of many of these patients, who were admitted, was very grave. The notes of one patient state that "this patient was pracically moribund on admission but recovered in an extraordinary way after aspiration of 10 ounces of liver abscess pus." Frequently more than one aspiration is necessary to bring about a cure.

Eleven cases recorded in my own wards show that a cure was registered after one aspiration in five patients, after two aspirations in three patients, after three aspirations in two patients and after four aspirations in one patient. The danger with Indian hospital patients is that there is such immediate and rapid improvement after aspiration of a liver abscess that they frequently consider themselves cured and insist on leaving the hospital, only to return at a later date with the abscess re-filled or because of further complications occurring.

Diseases of the Stomach.—Ulcer of the stomach and duodenum is now very readily recognized in this hospital, and the prevalence of this disease is shown by the fact that during the year under review no less than 226 operations were performed for these diseases by six surgeons. In my own wards 50 patients have been treated as follows:—

Disease.	No. of patients.	Died.	Mortality rate per cent.
Duodenal ulcer	.. 46	3	6.5
Gastric ulcer	.. 2	Nil	Nil
Cancer of the stomach	.. 2	1	50

Of the above, 2 were patients admitted with acute perforation of duodenum. One was operated upon 2½ hours after perforation occurred and the second 19 hours. Both recovered, although the second had a somewhat stormy convalescence. The symptoms shown by these patients show nothing of special note other than what was reported last year. Visible peristalsis was noted as present in 32 of these patients, showing the advanced general condition in which they seek hospital treatment. The average duration of symptoms is 3.5 years, the longest being 20 years and the shortest 6 months. One patient only was a woman, a desperate case suffering from cancer of the stomach (pylorus) and who died as a direct result of the operation. The mortality rates in these operations have been steadily improving during the last year, a result largely due to the absence of pneumonia following the operations, and to the experience which the nurses in the post-operative wards have received in this class of patients. The desperate condition to which these patients have arrived before coming to the hospital is shown by a record of their weight. No less than 21 of these patients weighed under 80 lb. while one weighed only 40 lb., a man of 22, and two others weighed 65 and 64 lb. No less than 28 are noted as suffering from pyorrhœa or from a septic condition of the teeth and I consider that the very careful attention which we now give to the mouths of these patients has been mainly responsible for the almost total disappearance of post-anæsthetic lung trouble. The average age was 35 years, the oldest being 60 and the youngest 16.

Posterior gastro-enterostomy, vertical no-loop method, has been performed in all these cases, and the appendix has been removed as a routine except in 7 where the condition was too desperate to warrant the extra procedure. The microscopic reports obtained of 36 appendixes so removed showed that 18 were normal, 12 showed evidence of chronic inflammation and 6 contained thread worms. A further careful investigation of this last figure during the past few months has shown that a much larger percentage of appendices in India contain thread worms. If the appendix is placed in preserving fluid and sent to the pathologist for microscopic examination, the thread worms are generally missed, but if examined at the time of operation we rarely fail to find one or several thread worms in the organ. This together with the high percentage of septic infection of the mouth (28 in 46 patients having pyorrhœa or infected teeth) is still considered a possible source of the duodenal infection and ulceration. It is difficult to assign any other cause for the high prevalence of this disease amongst people in South India, although it must be remembered that the General Hospital draws its patients from over a wide area.

As to caste, only 3 of these patients were Indian Christians, 3 Muhammadans and the remainder, 40, Hindus, but this figure is really of no special value.

(1) Four patients died as the result of the operation, one following the operation for cancer, really an inoperable case but in whom an almost complete stenosis of the pylorus due to gastric cancer rendered some method of relief imperative. (2) One died of chronic sepsis with intestinal obstruction 22 days after the operation. It was difficult to account for this, as there was no leakage from the anastomosis and the sepsis was of a very low grade. (3) One patient died suddenly of heart failure 8 days after operation and post-mortem elicited the fact that he had advanced atheroma of the coronary arteries and that death was due to sudden heart failure. (4) This patient also was severely ill, and died apparently from shock following the operation. In addition to the duodenal ulcer he had a chronic cholecystitis and experience has proved that this type of patient runs a very much graver risk than one whose liver is not affected.

Hernia.—Fifty-two operations, classified as follows:—Right inguinal hernias 25, left inguinal 12, recurrent hernias 6, ventral hernia 1, direct inguinal hernia 4, (sliding hernias 4), irreducible 1, strangulated hernias 2, with intestinal 2.

The average age of these patients was 32, the oldest being 60. Of the recurrent hernias, in 5 Bank's operations has been performed, i.e., suture of the conjoined tendon to Poupart's ligament over the cord. Some years ago this operation was very frequently practised for the cure of inguinal hernia in Madras, and has of late years provided the great majority of recurrences seen in this hospital. The hernia recurs as a rule at the lower part of the canal, which is left open over the passage of the spermatic cord. In these 5 patients, the conjoined tendon had become firmly united to Poupart's ligament and I have seen no evidence to support the theory recently advanced that such union of muscle to ligament never takes place. The remaining case had apparently suppurated at the original operation and there was no attempt at union whatever. A sliding hernia, a fairly common type of hernia in Madras, was found in four patients. Each had a right inguinal hernia containing the cæcum and ascending colon, which had prolapsed through the hernial ring, the posterior portion of the mass consisting of the intestinal vessels. No difficulty was found in any of these cases in pushing back the hernia and sewing up the ring, but in one patient in whom the hernia was strangulated the operation was fatal.

Appendicitis.—There were 29 operations for appendicitis, among the following classes:—Europeans 10, Anglo-Indians 9, Indian Christians 3, Hindus 5, Muhammadan 1 and Parsee 1.

One European, one Anglo-Indian and three Indian Christians were operated upon for chronic dyspepsia in whom only a chronic appendicular condition could be found, the removal of which was apparently successful in curing the disease.

One European admitted with severe gastric symptoms and persistent vomiting extending over three weeks was cured by the removal of a normal appendix which contained several thread worms. No other treatment was adopted and he has remained well since.

Four Hindus, one Indian Christian and one Muhammadan were all admitted with definite symptoms of acute appendicitis verified and cured by operation.

Fracture of the Spine.—In February 1922 I reported a case in the *Indian Medical Gazette* of fracture of the atlas vertebra, which was not followed by a fatal result. A similar case was admitted into my ward during the past year and was reported in the College Magazine by Mr. C. Krishnaswami Pillai, Assistant Professor of Surgery. The patient, a boy of 10, was admitted for paralysis and with a history that six months previously he fell from the top of a tree and remained unconscious for 24 hours. His symptoms cleared up in a day and he went about his work with hardly any discomfort. After two months, he noticed increasing weakness of both arms, which soon developed into paralysis of all his limbs.

On admission the patient was found to be suffering from marked paresis of all his limbs, with paresis of the abdominal wall, back and neck. Sensibility was unaffected, reflexes were exaggerated, and electrical reactions were normal. A bony tumour could be felt at the back of the neck, but not through the pharynx, which *x*-rays proved to be a thickened and displaced atlas vertebra. Diagnosis, fractured atlas vertebra with callus formation.

The patient was kept in bed with a weight extension fixed to the head, and after four months treatment was discharged from hospital with complete recovery.

"The nature of the injury is explained by the direction of the articular facets of the atlas vertebra and by the force producing the injury, which acts upwards by the weight of the body through the vertebral column. The articular facets of the lateral masses of the atlas are obliquely placed, the upper pair looking upwards, backwards and inwards, and the inferior pair downwards and inwards. The result of such a fall would be a horizontal force tending to cause separation of the lateral masses from each other and a consequent tension fracture at the weak points, i.e., the anterior and posterior arches."

Renal Surgery.—Operations on the kidney, 4. Two patients renal calculus, nothing present of note. One patient with a large suppurating pyelonephrosis died as a result of septicæmia after drainage had been established. The remaining patient presents a condition of considerable interest. A European, aged 33, was admitted for hæmaturia with a history that he had suffered from the same complaint on two former occasions and had been severely injured in the left loin by a shell during the war. Cystoscopy showed gushes of hæmorrhage issuing from the left ureter, but there was no ulceration or disease round the ureteral opening. The urine from the right ureter was normal in colour. As the patient was showing signs due to the continued loss of blood, operation was decided upon and the left kidney explored by the usual lumbar incision. The ureter and pelvis were distended with blood but no evidence of tumour, disease or stone could be found either in the kidney itself or in the pelvis, which was explored through an incision in the kidney. After a small portion of kidney substance had been removed for microscopic examination, its capsule was stripped and the wound sutured after leaving a small drain through the kidney wound. No other treatment was adopted. Following the operation, the urine became quite clear within 24 hours and the wound healed rapidly. The patient presented no further symptoms and was able to sail for England, apparently well, two months after the operation. Microscopic examination of the kidney specimen showed the affection to be a subacute nephritis (chronic parenchymatous nephritis—large white kidney).

Reviews.

APPLIED PATHOLOGY IN DISEASES OF THE NOSE, THROAT AND EAR.—By Joseph C. Beck, M.D., F.A.C.S., Associate Professor of Laryngology, Rhinology and Otology, University of Illinois College of Medicine. St. Louis: C. V. Mosby Co., 1923. 280 pp. 268 illustrations. Price $7·50.

This is an admirable book, not alone for the nose, throat and ear specialist, but also for the general practitioner and the hospital resident. The fundamental object in the analysis and management of a case is—or should be—a definite knowledge of the underlying pathological changes present; too often is treatment in nose, throat and ear conditions purely empirical. Thus the ordinary practitioner looks for mastoid swelling in a case of otitis media, but may fail to appreciate that far more dangerous conditions such as septic thrombosis