means of a suitable apparatus, bony union becomes so complete that not a vestige of the injury can be traced. Besides, perpendicular fractures readily admit union by bone.

It would be unnecessary to discuss the obvious advantages of bony over ligamentous union. M. Depret appears to advocate the latter, because he can relate cases where patients sustained fractures on two occasions in the same bone, stating that it was the bone and not the ligamentous union that gave way; and attempts to prove thus, that the fibrous union is stronger than the bony. Surely, if he reflects, he will understand that the seat of the fracture depends upon the position of the limb.

The advantages claimed for this appliance are as follow. 1. It is suitable to any limb. 2. Tilting of the fragments cannot occur, the traction being downwards and backwards. Should there be a slight tendency to such, the strap fastened to the two buttons on the adjusting pads will prevent it. 3. The splint provides for the position of the limb. 4. There is no pressure on the arterial supply of the patella. 5. There is no risk to the life or limb of the patient (as may be by the hooks, or stitching the fragments). 6. It will produce perfect co-adaptation without injury to the soft parts; and without pain and irritation. 7. It can make well maintained traction on the upper as well as the lower fragment, if required. 8. No fluid can separate the fragments. 9. The patient cannot interfere when adjusted, as in the plaster and other methods. 10. It has produced the best result—bony union.

PRIMARY CANCER OF THE LIVER.*

By JOSEPH EWART, M.D.,

Late H.M.'s Bengal Medical Staff.

IN introducing to this meeting the subject of primary cancer of the liver, it is needful, at the outset, to say that no attempt has been made to treat it exhaustively. The opinions advanced—with special reference to diagnosis—are based on the clinical observations of the cases cited below.

CASE I. *Primary Cancer of the Liver: Cholæmia; Death.*—C. —, aged 60, a robust and strongly built man, of strictly temperate habits, had resided upwards of twenty years in Calcutta, leading a most active and useful life. In 1866, he was invalided home for a year on account of enlarged and congested liver, attributed to repeated attacks of malarious fever. On the expiration of his leave, he returned to duty with his health completely restored. In 1874, after an attack of typhoid fever, he was again sent to England. The liver was then enlarged and tender, with slight jaundice. After remaining in this country for a year, he quite regained his health. He resumed work in India during the cold months, and was occupied in planning a system of drainage and sewerage for the city of Madras. He subsequently visited St. Petersburg, and designed a scheme for the purification of that city. In September 1878, he returned from a visit to Sydney and other towns in Australia, where he had been engaged in maturing an improved system of drainage for the principal towns in these colonies. He reached his home in what appeared to himself and his friends in excellent health. He remained so until July 1879, when he went to Eastbourne for the benefit of some members of his family. About the end of the month, he, without any tangible cause or discomfort, suddenly became jaundiced. There was then no discernible enlargement of the liver; but, in spite of all the drugs had recourse to, change to, and the use of the waters of, Harrogate in August and September, he continued to be intensely jaundiced down to the date of his death, on the 25th of January last. During the whole of this period, about five months, no bile whatever seems to have passed into the alimentary canal through the ordinary channel, the stools having been white and destitute of admixture with the colouring matter of this secretion.

In October, he consulted an eminent physician, who then assured him, after careful examination, that there was not even then any material enlargement of the liver. A month later, he was again examined by the same authority, when slight fullness and enlargement were discerned. In December, he consulted another physician, who recognised still further swelling of the organ. I saw him on the 12th January last, and then had no difficulty in diagnosing the existence of malignant disease of the liver, which was hard and nodulated and greatly enlarged. Below, it was felt to reach an inch beyond the umbilicus, and to the crest of the ilium; above, it extended almost to the angle of the scapula and the nipple. The tumefaction seemed confined to the right lobe of the organ.

As had been the case all along, there was not the slightest tenderness or pain. The jaundice was remarkably developed; the urine porter-

coloured, plentiful, and containing abundance of bile, with many evidences of tyrosine crystals. There were anorexia, flatulency, a foul tongue, offensive eructations, fetid and absolutely white evacuations, only varied to a moderate degree by the mercury which he had been taking. The emaciation was as extreme as the cachexia had been remarkably developed. He was singularly free from nausea. There were some purpuric spots on the trunk, before and behind. The pulse was weak, but not accelerated; temperature normal. During the whole course of the illness, the temperature does not appear to have been abnormally elevated at any time. There was and had been a good deal of irritation and itchiness of the skin. Two days before death, I again saw him, with Sir Joseph Fayrer, who also arrived at the conclusion that the case was one of rapidly proliferating primary cancer of the liver. He was then suffering from considerable dyspnoea; the pulse was weak; the extremities were cold; there were large patches of purpuric extravasations on the legs and arms, ears, nose, and trunk, and much drowsiness; the urine was diminished in quantity, indicating that the kidneys were clearly unequal to the great and prolonged strain of compensatory duty imposed upon them. He died comatose on the above-mentioned date. No *post mortem* examination could be obtained.

CASE II. *Primary Cancer of the Liver: Cholæmia: Death.*—In January 1867, a Hindoo woman, the mother of four children, aged 45, was admitted under my care in the Medical College Hospital, Calcutta, suffering from jaundice. Four months ago, whilst in the enjoyment of good health, she suddenly became jaundiced, with porter-coloured urine, indigestion, white evacuations, flatulency, loss of appetite, and itchiness of the skin. There had been no local pain; but she experienced a sense of heaviness or weight in the hepatic region. She continued to perform her household duties till within a week of her admission, when the following symptoms and condition were noted. Jaundice was extremely developed, the yellow tinging being observed in the conjunctivæ and tears, the mucous lining of the mouth, fauces, throat, in the roots of epilated hair, and in the nails of the fingers and toes. There was yellow vision. The urine was dark and porter-coloured, free from albumen, loaded with bile, and containing abundant crystals of tyrosine; the motions were white; the skin was dry, harsh, and irritable, especially at night. The tongue was coated; she had much thirst, depraved taste in the mouth, bad appetite, and occasional nausea, but without vomiting. The pulse was weak and full; there was occasional febrile action, but neither marked nor prolonged at any time. There was great emaciation. The liver reached to the umbilicus and the iliac crest below, and to the nipple and angle of the scapula above. The whole of the region occupied by the tumefied viscus was full and swollen. The left decubitus was accompanied by a sense of weight and dragging. The recumbent position and right decubitus were not attended by any discomfort. There was no pain or tenderness. Over one of the protuberances, a sense of deep-seated fluctuation existed; but, as this was regarded as being due to the well-recognised resiliency communicated by a rapidly proliferating medullary carcinoma, no exploration was made. The emaciation proceeded; orthopnoea supervened; large purpuric spots appeared on the face, hands, arms, and trunk; the kidneys gradually struck work; coma came on; and, after remaining in a state of insensibility for two days, she died on February 25th.

On making a *post mortem* examination, six hours after death, the cancer was found to be restricted to the liver, which weighed one hundred and thirty ounces. It was nodulated from cancerous growths. The glands around the common duct were enlarged from cancerous growth, causing the complete obliteration of this and of the cystic duct. The gall-bladder contained a small quantity of pale-coloured fluid. Some of the bile-ducts were enormously dilated, and distended with bile. Large masses of medullary carcinoma occupied the right lobe—a great portion of the secreting structure, with its vessels, nerves and lymphatics, and efferent ducts, having been displaced and destroyed. The left lobe was free from cancerous material. Every other organ was healthy. All the parts viewed were deeply tinged with the colouring matter of the bile. On examining the cancerous masses by the microscope, caudate and endogenous cells, smaller round or oval cells, and nuclei in much greater abundance, were found.

CASE III. *Primary Cancer of the Liver: Cholæmia: Death.*—In December 1873, I was consulted by a lady of Eurasian descent, aged 60, the mother of a grown-up family of six children, suffering from jaundice of three months' duration. The liver was greatly enlarged; but there had been little or no local pain. The surface was irregular, and somewhat nodulated. The kidneys had been working well, carrying off quantities of bile. There was marked emaciation and cachexia. The symptoms, during the two months she was under my care, were similar to those recorded in the preceding cases. She eventually died comatose, about five months after the onset of the jaundice.

On *post mortem* examination, the liver was found to weigh one hun-

* Read before the East Sussex District of the South-Eastern Branch.

dred and sixteen ounces. The right lobe was studded with cancerous growths, varying in size from a hazel-nut to a large orange. There was one large mass in the centre of the left lobe. The glands in the vicinity of the common duct were much enlarged from cancerous growth, compressing the same completely. The ducts behind were much dilated, and full of tenacious viscid bile. There was about a pint of pale straw-coloured fluid in the cavity of the peritoneum. All the tissues were tinged yellow; but there was no cancerous deposit in any of the other organs or parts scrutinised.

CASE IV. Primary Cancer of the Liver: Internal Hemorrhage: Death.—In May 1872, a cachectic Hindoo, aged 52, was under my care with enlargement of the left lobe of the liver. It had been first noticed four months before. It was very tender and painful. By its pressure upwards, it embarrassed the action of the heart, thus somewhat elevating the area of the cardiac dulness. Downwards, it reached the umbilicus. Laterally, it occupied a considerable portion of the left hypochondrium. Posteriorly, it unduly compressed the stomach, causing hiccups, nausea, and vomiting. It bulged prominently forwards. By placing the hand firmly upon it, the impulse of the aorta, communicated at each systole, could be distinctly recognised. There had been frequent febrile exacerbations. There was no jaundice. There was considerable cachexia and emaciation. There had been no hectic or colliquative night-sweats. There was no clear history of a rigor. Still, as he had been sent to me as having hepatic abscess, and as there was some sense of what to me appeared to be deep-seated fluctuation, an exploration was made with a fine aspirating needle—only, however, with the result of obtaining a small quantity of material, made up of blood-cells, large irregular cells, a few endogenous cells, and an immense proportion of nuclear-looking bodies. The patient died suddenly on June 20th. At the *post mortem* examination, twelve hours after death, about a couple of pints of blood (partly fluid and partly coagulated) was found in the peritoneal cavity, having escaped from a large fungating cancerous mass springing from the left lobe of the liver, the structure of which had been almost completely destroyed. The right lobe was unaffected. No other organ or part was involved.

REMARKS.—The chief aim I have had in view, in describing these four cases of primary cancer of the liver, has been simply to draw attention to some points bearing upon its diagnosis. Beyond palliation, nothing can be hoped for from the administration of drugs. But the earliest possible arrival at an opinion concerning the probable nature of the case presented is, nevertheless, very important—inasmuch as it may be the means of saving the patient from much harassing and drastic treatment. Thus might the symptoms due to the absence of bile from the alimentary canal, on the one hand, or to its presence in large quantities in the blood, on the other, be materially alleviated. The difficulty of establishing a correct diagnosis is enhanced by the facts, that primary carcinoma of the liver usually commences painlessly in the substance of the organ, and that it may attain considerable dimensions before attention is attracted to it. Thus, in the first three cases, it probably existed some time—how long it is impossible to say with anything like precision—before the glands in the portal fissure became sufficiently enlarged to cause jaundice by compression of the ductus communis choledochus. There is reason to believe that the obstruction of the duct is effected insidiously, gradually, and painlessly. Especially is this accomplished with freedom from pain when the cystic duct is also occluded simultaneously, or soon after the closure of the common duct. In this way, the channels behind become, in a measure, reconciled to an excessive accumulation of bile; the urine becomes dark-coloured, carrying off the bile absorbed for some time prior to the date of complete obstruction, and so preventing the outward manifestation of jaundice. When the occlusion is perfected, jaundice makes itself apparent in twenty-four or forty-eight hours, and persists with intensity, increasing in proportion to its subsequent duration, during the brief remainder of the patient's life. I have never been satisfied that, in the earlier stages, pain has been referred to the site of obstruction. When the cancer-growths approach the surface, causing intense tension of the capsule and irritation of the superjacent peritoneum, pain is doubtless produced. But it will have been observed, from the conduct of the three first cases narrated, that enormous enlargement may take place without pain or tenderness being complained of. In the fourth case, there was a good deal of pain due to peritoneal inflammation; but there was no evidence of its existence until the growth had reached a considerable size.

That a large portion of the parenchyma of the liver may be gradually and painlessly destroyed is demonstrated in large hydatid cysts, centrally situated; yet, a sufficiency of bile is secreted for the wants of intestinal digestion, the support of the blood, and the maintenance of animal heat. So, indeed, within certain limits, it may be with the invasion of carcinoma. The grand distinction is that, as the growth advances, the malignant or cancerous cachexia is soon developed with

marked and progressive emaciation; and these conditions are much aggravated and intensified if jaundice, as is generally the case, be present. It must be recollected that jaundice may occur painlessly from enlarged glands due to syphilitic or tubercular growths, or to other causes. The further progress of the case, either towards amelioration or the contrary, will enable the physician to add clearness and precision to the diagnosis during the middle and later periods of life. In most cases, jaundice supervenes about five or six months before death; and, when once developed, it not only never disappears, but becomes more and more marked and intensified. The advent of death is chiefly dependent upon the inability of the kidneys to go on ridding the blood of the bile with which it is being constantly poisoned and contaminated.

TREATMENT OF SPRAINS.*

By R. DACRE FOX, F.R.C.S. Edin.,

Surgeon to the Manchester Southern Hospital; Chief Medical Officer to the Manchester, Sheffield, and Lincolnshire Railway Company; etc.

THE frequency with which sprains occur in general practice, and the somewhat unsatisfactory results of the treatment ordinarily adopted, induce me to bring forward a method that I have used in a great many cases with considerable success. Sprains may be broadly divided into two kinds, mild and severe; the former consisting merely of a temporary overdistension of the parts around a joint, which rest and anodyne applications usually soon cure; the latter involving, as I believe, much more serious pathological results, which the following plan is specially contrived to obviate.

The effects of a severe sprain are, that the fibrous ligaments controlling the movements of the joint and binding the tendons in their grooves become overstretched, swollen, and softened; the cellular tissue about the ligaments and in the tendon-grooves becomes oedematous; and plastic material is exuded; while, as a consequence of these changes, the tendons are displaced in their beds. If this condition be not actively treated, it may, and often does, lead to continued lameness, due, in all probability, partly to a diminution in the calibre of the tendon-groove, with impaired muscular action, and partly to the torn ligaments and bruised cellular tissue having undergone changes which render them incapable of adapting themselves to the movements of the joint, which are consequently impeded. I believe this result may be prevented by the application of firm direct equal pressure, applied manually at first, and kept up and controlled by pads placed in the line of the tendons, and kept in position by properly shaped plasters and bandages, and sometimes by splints. This pressure helps to disperse the oedema, to replace the tendon in its normal position, to hasten the absorption of any plastic exudation, and thus to prevent diminution in the calibre of the tendon-groove. I cannot say this is a novel method of treatment; but I think it is one not usually practised, partly because it entails the expenditure of much time and trouble, and partly, I feel sure, because there is and has been a tendency to underestimate the inconvenience and distress arising from a badly sprained joint.

The common practice, in treating a sprain, is to put on a bandage, telling the patient to take it off if the joint becomes painful, and to substitute warm water fomentations. When the swelling has subsided, if the injury be not so slight as to be already cured, a liniment or the application of iodine is generally ordered. Very frequently the tight bandage causes inflammation, while the rubbing and painting are practically useless. There are numbers of cases of slight sprain, indeed, which will get well with comparatively little treatment or none at all; but in that more severe form where, after an inflammatory or at least exceedingly hyperæmic stage, swelling takes place, with the results I have described, the application of these remedies does not prevent the joint from being left rigid, painful, and unfit for use for a very long period. Now it is, as I have said, in preventing all this, that the plan of treatment by direct, equal, and continuous pressure will be found exceedingly valuable; for, where it has been properly carried out, I have always found that the joint returns quickly to its normal condition—pain being speedily relieved, and rigidity prevented. The treatment may be divided into two stages; the first lasting from a day to a week or longer, during which the treatment has to be directed to averting inflammation by rest, warm applications, anodyne lotions, etc.; the second commencing when the joint has become cold, swollen, and painful on movement—in fact, when the injury has assumed a more or less chronic character. It is during this second period that I believe the active treatment I advocate ought to be employed. It is important

* Abridged from a paper read before the Lancashire and Cheshire Branch.