tions of the part, for example, in ossification of the ligaments of the spine, and of the joints and ligaments of the ribs.

The true pathology of many forms of bony ankylosis, such as those illustrated by Cases iv, v, and vi, is at present, I believe, unknown.

I will not occupy the time of the Section by entering at any length on the clinical aspect of cases of bony ankylosis. I will only enumerate four propositions: 1. Whenever this condition seems likely to occur, great care should be taken to keep the joint concerned in a useful position. 2. We know of no means by which a threatened bony ankylosis can be averted. 3. The use of passive movements cannot prevent bony ankylosis. Indeed, by maintaining irritation and promoting inflammatory exudation, it is likely to produce a directly opposite result. 4. When bony ankylosis has occurred, excision or osteotomy may be freely employed, in order to correct any deformity that has taken place, for by methods that are now available these operations are attended with scarcely an appreciable risk.

[The author is indebted to Messrs. Cassell and Co. for permission to reproduce these illustrations from his work on *Diseases of the Joints and Spine* (Cassell and Co., 1895).]

Mr. TARGETT laid stress on the distinction between ossification of the vertebral joints and of the ligaments, comparing the latter to myositis ossificans. He had never seen ossification in Charcot's disease without previous suppuration, that is, perforating ulcer. The disease was almost always attended with atrophy of bone, which was not shown in the specimens exhibited. He therefore doubted whether Charcot's disease was present in these cases. The most rapid and complete ankylosis without suppuration was found in puerperal fever and other kinds of sepsis. Dr. Fagge's case may have been one of quiet tuberculous ankylosis, since there were tuberculous deposits in the mesenteric glands.

Mr. BOWLBY remarked that in one of the feet shown there had undoubtedly been suppuration, which, however, was far anterior to and quite independent of the ankylosis. The case was one of undoubted tabes. In his case of ankylosis following injury to the median nerve there was partial ankylosis of all the joints of the hand. After nerve injuries the joints supplied by them undergo changes somewhat like those in acute rheumatism, becoming swollen, tender, and partially ankylosed. These changes are not, as a rule, permanent, but there may be a deposition of fibrous tissue in the ligaments, particularly on the flexor surface of the hand, often leading to permanent stiffness. He agreed with Mr. Marsh's division of bony ankylosis into degenerative and reparative. He also pointed out that many joint lesions were due to disease of the central and peripheral nervous system, such as syringomyelia and disseminated sclerosis, and said that in the near future osteo-arthritis would probably be shown to have the same origin. Mr. Bowlby believed that many cases of bony ankylosis without suppuration lie latent in museums through having no histories attached.

Mr. BLAND SUTTON refused the title of quiet tuberculous as applied to the axis and cervical vertebrae shown by Mr. Marsh, on the ground that the time of life was too late. Similar specimens, with the occiputs joined on, were to be found in most museums. Many had been turned up in graveyards, and one was found in a mummy from the Pyramids. The condition was not thoroughly explained in all cases, but Mr. Arbuthnot Lane had suggested that the skeletons were those of costermongers and others accustomed to carry weights on their heads. Mr. Sutton had confirmed this in the case of the Paris oxen, which are yoked by the horns. He also pointed out that in the veterinary museums at Alford and Camden Town there are numerous skeletons of horses showing ankylosis due to ossification of the anterior common ligaments and ligamenta subflava. This may cause snapping of the vertebral column in horses cast for operation.

Mr. ELLIS (Gloucester) referred to the condition known as hallux flexus, rigidus or dolorosus, which he considered due to the outward pressure of the median-pointed boot pressing the great toe under the adjoining ones. The joints most exposed to irritation are most subject to this disease, and ankylosis is here reparative.

Mr. MARSH, in answer to Mr. Bland Sutton, said that in his experience tuberculous disease of the spine might occur

with well-marked angular curvature up to the age of 70, and he had heard of it at 90. Ankylosis of the spine from ossification of ligaments was more than a pathological curiosity in man; if it was complete the patient was very helpless; and when it was associated—as was often the case—with ankylosis of the ribs, it was very likely, if bronchitis or pneumonia occurred, to interfere with respiration so seriously that the result was fatal.

ON SPLENECTOMY, WITH NOTES OF THREE CASES.¹

By W. D. SPANTON, F.R.C.S.ENG.,
Surgeon to the North Staffordshire Infirmary.

I HAVE now performed the operation of splenectomy three times—two of the cases being followed by a fatal result, one by recovery—and they are sufficiently typical to afford an opportunity to consider the subject in its general aspect, and to endeavour to deduce from them some observations of practical importance. It is only during the last few years that the propriety of such an operation has gained favour. In this respect the operation stands by no means alone, for almost all formidable surgical procedures have had to pass through a similar ordeal, and it is only by experience that we are enabled to eliminate cases unsuitable for operation, and to perfect our methods of performing it so as to render it at the same time justifiable and reasonably safe. The records of the cases are as follows:

CASE I.²—Mrs. S. B., aged 47, married, admitted into North Staffordshire Infirmary under Mr. Spanton, September 1st, 1883. Patient always strong, no illness until the present. Twelve children, all living, youngest 4 years old. Never been abroad, and never lived in ague district. Illness commenced two years ago with pain and enlargement on left side of abdomen. She thought at first that she was pregnant. The pain has never been very acute, but chiefly of a dragging character.

The enlargement of the abdomen increased gradually, and twelve months ago she became an in-patient in the medical wards on account of the inconvenience it caused her. At that time she was able to get about to do her household work, and was fairly stout and strong.

The tumour then was very distinct, and had all the characters of an enlarged spleen. It extended to within about 1½ inch of Poupart's ligament; in fact it covered nearly half the abdomen. Since leaving the infirmary she has been under medical treatment outside, but without any benefit resulting.

There had been no ague fits or any attacks of that nature before her first admission, but during the last few months she has sometimes felt cold, which has been followed by a free perspiration. For the last twelve months she has lost flesh rapidly and has got so weak that she cannot get about to do anything. Digestion fairly good, no sickness, no marked anaemia, catamenia absent for about twelve months.

Urine contained phosphates but no albumen. Blood examined under microscope was found to present no marked deviation from a normal specimen; the white corpuscles were not increased and the red ones were well formed. The patient had an anxious expression, appeared much troubled about her complaint, and was prepared to submit to any operation. She suffered from severe pain in the head and in the abdomen while in the infirmary, and the temperature varied from 100° to 103°F. She had no distinct shivering attack but perspired much when the pain was most severe. A consultation was held and it was decided to operate, but on account of her condition it was thought advisable to postpone it until the temperature had subsided.

On September 11th she seemed much better, the pain was less and the temperature was only 99°F. It was therefore arranged for the operation to take place on the following day.

The patient was removed to Victoria Ward on September 12th, but no purgative was given and no enema administered because a few days before she had a tendency to diarrhoea.

¹ Read in the Section of Surgery at the Annual Meeting of the British Medical Association, held in London, July-August, 1895.

² This case was briefly reported in the BRITISH MEDICAL JOURNAL, 1883.

September 12th. In very good spirits, very little pain except in the region of the spleen, temperature 99°F., no diarrhoea, slight cough, and a few *râles* audible on the right side of the chest, but no dulness on percussion and no physical sign on the left side.

The tumour was smooth on the surface, very hard, and extended from the fifth rib above to Poupart's ligament below; forward it extended across the middle line to the outer margin of the right rectus. The notch could be felt two inches below the umbilicus, and one inch to the outer side. The margin above and below this was smooth and regular, convex from above downwards, with the convexity towards the right. The tumour could be lifted forwards by pressure in the left flank, and the right margin was sufficiently thin for the hand to be passed behind it. In front, where the experiment was practicable, the abdominal wall could very readily be separated from the tumour. It occupied a larger portion of the right side of the abdomen when the patient lay on her right side, but quickly assumed a different position when the position of the patient was changed. The liver dulness extended a little distance below the ribs, there were no enlarged glands in the axilla or groin, and no congestion of the superficial veins of the abdomen. The heart was normal.

The operation was commenced at 4.40 and concluded at 5.55. An incision was made in the median line, from near the xiphoid cartilage, 9 inches downwards. The small lobe of the liver first came into view, and next the great omentum; the omentum was drawn to the right, and the spleen was then exposed; it had a very congested appearance, and the veins of the great omentum were considerably enlarged. The spleen was lifted upwards, and a large vessel ligatured beside some smaller ones.

It was proposed to pass one large ligature round the base of the tumour as a preliminary measure, but this could not be done without breaking down its connection with the diaphragm. Many vessels were also ruptured in the attempt. Two ligatures were, however, passed in this way, the one from the inner and the other from the outer side. The spleen was then quickly removed, and it was found that the ligature had secured most of the vessels.

Some smaller ones were tied with thick silk, and Tait's clamp was applied to that part of the pedicle formed by the gastro-splenic omentum. The large vessels were tied with whipcord, by means of a double threaded aneurysm needle. There was a considerable amount of hæmorrhage at the commencement of the operation, for in the endeavour to lift the spleen from its bed, some vessels on its under surface were ruptured, but after these had been secured there was no great hæmorrhage throughout the operation. The amount of blood lost was estimated by those present at a pint.

After the clamp had been applied all hæmorrhage appeared to have ceased. A small lateral incision was made in order that the clamp might be brought to the surface, and secured without any tension in the pedicle. The whole wound was then closed by means of silk sutures, the clamp lying over the left rectus in a vertical direction. The spray (*Sanitas*) was playing over the patient before the operation, but was discontinued when the incision had been made. The wound was dressed antiseptically. During the removal of the spleen the bowels were prevented from protruding as far as possible by means of warm chamois leather and sponge cloths.

The pulse was good after and during the operation. The patient was removed to the bed which was at the side of the operation table, and an enema of brandy and milk given. She soon rallied and was able to describe her symptoms. She said she felt sick but had very little pain. The retching was troublesome, but otherwise everything appeared to be going on favourably. The pulse remained good.

At about 9.20 P.M. she became suddenly worse, and the nurse noticed her colour change, and the breathing became "gasping." When seen by the house-surgeon a few minutes afterwards the pulse had nearly disappeared, and from the dusky appearance of the countenance and the character of the breathing internal hæmorrhage was diagnosed.

A consultation was held with Mr. Spanton by means of telephone, but under the circumstances it was not thought advisable to reopen the wound.

Death occurred at 9.50 P.M. Weight of spleen, 8 lbs. 1 oz.

(after draining). Measurements, 14 inches by 8 inches, by $5\frac{1}{2}$ inches greatest thickness. Structure simple hypertrophic.

At the *post-mortem* examination eighteen hours after death rigor mortis was well marked. The abdominal cavity contained about a pint and a-half of blood, chiefly clotted; a large silk ligature was found lying loose on the blood clot, but the mouth of a large vessel could not be detected. The kidneys were normal, heart normal, liver enlarged but otherwise healthy. The lungs had the character of bronchitis, which was more marked on the right side and at bases. The brain was not examined.

Remarks.—The fatal result in this instance was clearly due to hæmorrhage, although at the time of closing the wound everything seemed secure. The pedicle was very large, and the vessels in it enormous, and this led me to leave on it the clamp as a safeguard. The bleeding probably occurred in this, as in some other recorded cases, from a vessel not included in the main pedicle, and the loose ligature pointed to this, although no open mouth was apparent. In the light of more experience I think that if the suspensory ligament had been dealt with first the result might have been different. The tumour was very large, very friable, and the pedicle was comparatively short, all of which tended to make excision more difficult, especially in one's first operation of the kind.

CASE II.—Mrs. M., aged 52, married, admitted into the North Staffordshire Infirmary, January 20th, 1891, for enlarged spleen. Patient says she was quite well until eighteen months before, when she had typhoid fever, and was never well after. She had, however, been subject to epileptic attacks for some years. About a year before admission she first noticed a lump in the abdomen, which was then about the size of an orange, and steadily increased. Latterly she had become much paler, and suffered from severe attacks of sickness.

In the autumn of 1890 she was a patient in the medical wards for anæmia; had become much weaker since then; for the last month had been confined to bed, and was unable to stand without help.

On admission she was pale, emaciated, and feeble. Had frequent attacks of severe vomiting, accompanied by diarrhoea and often dyspnoea. Systolic murmur at base. Chest signs negative. Abdomen: A large firm tumour felt occupying left hypochondriac, iliac, and umbilical regions, extending to the middle line and downwards to a point $2\frac{1}{2}$ inches below umbilicus. A very distinct notch could be felt just above the level of the umbilicus. It was freely movable, and caused pain of a dragging character. The blood showed an excess of white corpuscles relatively to red. Urine was normal. After consultation it was decided to perform splenectomy, as the patient was steadily and rapidly losing ground after a full trial of medical and general treatment.

Operation, February 3rd, 1891.—Chloroform. An incision, 10 inches in length, was made in the left linea semilunaris, and the spleen readily exposed. There were no adhesions, and the tumour was withdrawn without difficulty. The pedicle was transfixed and tied with five interlocking silk ligatures, and divided. The bleeding was slight. Wound closed with silk sutures; no drainage. Alarming symptoms of collapse occurred when the tumour was being drawn out of the abdomen, but passed off after it was separated. The patient, however, never thoroughly rallied from the shock, and died eleven hours afterwards.

The tumour weighed $5\frac{1}{2}$ lbs., and appeared to be simply hypertrophic. *Post mortem* a considerable quantity of blood clot was found in the peritoneal cavity, but no open vessel nor loose ligature was seen.

Remarks.—In this case the patient was in a wretched state of health, although there was no very marked leucocythæmia. In fact, she remained florid to the last, but became much emaciated, so that she was confined to bed for some time before operation was resorted to. There was some hæmorrhage, it is true, but the death was, I think, attributable to shock, which was almost fatal during the operation. The pedicle was wide and short, so that it was difficult to avoid dragging upon it while the ligatures were being applied. I think, too, it would have been better had ether been employed as an anæsthetic.

CASES OF SPLENECTOMY WITH RESULTS. TABLE I.—*Leucocythæmic Cases.*

No.	Date.	Surgeon.	Place.	Sex.	Age.	Nature of Disease.	Result of Operation.	Weight of Spleen.	Post-mortem Notes.	Remarks.
1	1866	Bryant	England	M.	20	Leucocythæmia	Death from hæmorrhage in 80 minutes	4 lbs. 7 ozs.	1½ lb. of blood in abdominal cavity	Severe hæmorrhage at operation.
2	1867	Koeberlé	Strassburg	F.	42	"	Death almost immediately	17 lbs. 8 ozs.	—	—
3	1868	Bryant	England	F.	40	"	Death from hæmorrhage in 15 minutes	10 lbs. 6 ozs	1 pint of blood in region of spleen	Severe hæmorrhage at operation from adhesions.
4	1873	Watson	Edinburgh	M.	?	"	Death from hæmorrhage and shock	12 lbs.	—	—
5	"	Spencer Wells	England	F.	42	"	Death from peritonitis on 3rd day	16 lbs. 3 ozs.	—	—
6	1876	"	"	F.	27	"	Death from hæmorrhage in a few hours	Over 11 lbs	—	—
7	1877	Billroth	Vienna	F.	45	"	Death from hæmorrhage in 4 hours	6 lbs. 9 ozs.	One ligature found loose	Severe hæmorrhage from adhesions at the time of operation.
8	"	"	"	F.	31	"	Death from hæmorrhage in 1 hour	11 lbs. 11 ozs.	—	—
9	"	L. Browne	England	M.	20	"	Death from hæmorrhage in 5 hours	18 lbs. 8 ozs.	—	—
10	"	Fuchs	Behar	F.	40	"	Death from hæmorrhage in 18 hours	12 lbs. 13 ozs.	—	—
11	"	Simmons	Sacramento	M.	43	"	Death from hæmorrhage in 2½ hours	7 lbs. 8 ozs.	—	—
12	1878	Urbinate	Cösana	F.	?	"	Death from shock in 4½ hours	?	—	—
13	"	Geissel	Essen	F.	39	"	Death from hæmorrhage in 16 hours	9 lbs. 15 ozs.	—	—
14	"	Czerny	Heidelberg	F.	24	"	Death from hæmorrhage in 4 hours	?	—	—
15	"	Arnison	England	F.	37	"	Death from hæmorrhage in 5 hours	7 lbs. 13 ozs.	—	—
16	1879	Miner	—	F.	40	"	Death (? cause)	?	—	—
17	"	Poucel	—	M.	39	"	Death from shock in 2½ hours	?	—	—
18	1881	Franzolini	Udine	F.	22	"	Recovery	Over 3 lbs.	—	Knowsley Thornton classes this under Hypertrophy.
19	"	Haward	England	F.	49	"	Death from shock in 6 hours	7 lbs. 8 ozs.	—	—
20	"	Ternier	—	F.	34	"	Death (? cause)	?	—	—
21	1884	Rydygier	—	F.	?	"	"	?	—	—
22	1888	Fritsch	Germany	F.	28	"	Death from hæmorrhage in 5 hours	?	—	—
23	"	Rowell Park	—	F.	?	"	Death from hæmorrhage in 5 hours	?	Bleeding from diaphragm	—
24	1891	Tricomi	Padua	F.	26	"	Death from shock in 75 minutes	?	—	—
25	1892	Lawson Tait	Birmingham	F.	36	"	Death from hæmorrhage in 44 hours	13 lbs.	—	—

CASE III.—I was asked by my friend, Dr. Coulson Bull, to see Mrs. E., married, aged 38, on account of an abdominal swelling, to which the patient's attention had been drawn owing to severe pain in the left hypochondrium, which Dr. Bull attributed to localised peritonitis. She was then suffering much, and we came to the decision that the tumour was splenic and demanded operation. She was therefore admitted into the North Staffordshire Infirmary, and the following notes were then made by the house-surgeon, Mr. Sawers:

Admitted February 27th, 1895, complaining of a swelling of abdomen on the left side, and pain of a dragging character.

History.—For the last four years the patient had had a heavy dragging pain in left hypochondrium, worse when moving about. Since Christmas, 1894, she noticed that she was getting larger, and that there was a tumour in the left side of the abdomen, which had become rapidly larger during the last few weeks. She had lost flesh, and been subject to profuse perspirations.

Present State.—A rather spare woman, with little subcutaneous fat; lips a good colour, skin somewhat sallow, cheeks flushed, tongue clean and dry. Abdomen distinctly fuller on left side. There is a readily felt tumour occupying the left hypochondriac, lumbar, and umbilical regions. The anterior border reaches from the tip of the left ninth rib to about 2 inches below the umbilicus, and at its lowest point touches the middle line. The border is rounded and firm; no definite notch can be made out. The lower border runs somewhat upwards and outwards. The tumour does not completely fill

up the loin, there being felt a posterior border which runs vertically upwards from about 1 inch behind the anterior superior spine of the ileum to the margin of the ribs. The tumour is everywhere firm to the feel, is somewhat tender, especially posteriorly, and moves on respiration. Percussion note dull all over tumour, and dullness extends upwards to the level of the eighth rib in the mid-axillary line. Measurements—anterior border, 6 inches; greatest breadth, 7 inches; length of absolute dullness, 9½ inches. Blood corpuscles were counted, red 80 per cent.; no increase of white corpuscles. Urine normal, heart normal, chest normal except slight crepitation at left base.

Operation, March 11th.—Ether. An incision about 6 inches long was made in the left linea semilunaris, commencing just below the costal margin. The spleen then came into view, and was partially brought forward through the wound. A few adhesions between the surface and the abdominal wall were ligatured in two places and cut through. The suspensory ligament was then double-ligatured and separated, and the spleen then easily brought outside. The pedicle was transfixed with a blunt needle, and tied in two portions, one of which included the splenic artery before its division, the ends of one of the threads being carried round the whole and tied. Strong silk was used. The pedicle was then divided and the spleen removed. The splenic artery and vein were ligatured separately afterwards; the wound closed with deep and superficial silk sutures. Very little blood was lost during the operation, which lasted about thirty-five minutes.

CASES OF SPLENECTOMY WITH RESULTS. TABLE II.—*Non-Leucocythæmic Cases.*

No.	Date.	Surgeon.	Place.	Sex.	Age.	Nature of Disease.	Result of Operation.	Weight of Spleen.	Post-mortem Notes.	Remarks.
1	1549	Zaccharelli	Naples	F.	24	Hypertrophy	Recovery	2 lbs. 15 ozs.	—	—
2	1711	Feirerius	St. Carnigan	F.	30	Spleen in peritoneal abscess	"	?	—	—
3	1826	Wittenbaum	Rostock	F.	22	Hypertrophy	Death from hæmorrhage in 6 hours	5 lbs. 8 ozs.	—	—
4	1855	Schultz	Darmstadt	?	?	Spleen protruding from wound	Recovery	?	—	—
5	"	Küchler	"	?	?	Hypertrophy	Death from hæmorrhage in 2 hours	3 lbs. 5 ozs.	—	—
6	1865	Spencer Wells	England	F.	34	"	Death from (?) thrombosis on 7th day	6 lbs. 15 ozs.	—	First English case.
7	1866	Baker Brown	London	?	?	"	Death at the operation	?	—	—
8	1867	Péan	Paris	F.	24	Cystic spleen	Recovery	2 lbs. 8 ozs.	—	—
9	1873	Urbinate	Césana	?	?	Hypertrophied wandering spleen	Death from peritonitis on 3rd day	2 lbs. 14 ozs.	—	—
10	"	Koeberlé	Strassburg	F.	27	Hypertrophy	Death from shock in 17 hours	?	—	—
11	1876	Péan	Paris	F.	24	"	Recovery	2 lbs. 7½ ozs.	—	—
12	1877	Pollak	"	?	?	"	Death (?) cause	—	—	—
13	"	Martin	Berlin	F.	31	Wandering spleen	Recovery	Slightly increased weight	in	—
14	1878	Aonzo	—	?	?	Hypertrophy	Death (?) cause	—	—	—
15	"	Honzo	—	F.	24	"	Death from shock	—	—	—
16	"	Volnay d'Orsay	America	?	?	"	Recovery	—	—	—
17	"	"	"	?	?	"	Death (?) cause	—	—	Possibly the same as No. 16.
18	"	Czerny	Heidelberg	F.	30	Wandering spleen	Recovery	—	—	—
19	1881	Crédé	—	M.	44	Cystic spleen	"	—	—	—
20	"	Celso Bonora	—	F.	53	Hypertrophy	Death from hæmorrhage	—	Bleeding from diaphragm	—
21	"	Charleoni	—	F.	32	"	"	—	—	—
22	1882	Gussenbauer	—	F.	?	"	Death (?) cause	—	—	—
23	1883	Spanton	Hanley	F.	47	"	Death from hæmorrhage in 7 hours	8 lbs. 3 ozs.	—	—
24	1884	Billroth	Vienna	?	?	Lymphosarcoma	Recovery	—	—	—
25	"	Knowsley Thornton	England	F.	25	Hypertrophy	Death from hæmorrhage in 5½ hours	—	—	—
26	"	"Orlovsky"	Russia	F.	19	Cystic spleen	Recovery	1 lb. 11 ozs.	—	—
27	1885	"	"	F.	26	Hypertrophy	Death from hæmorrhage on 4th day	—	Bleeding from diaphragm	—
28	"	Albert	—	F.	?	"	Recovery	—	—	—
29	"	Prechovnik	—	F.	?	"	"	—	—	—
30	"	Donat	—	F.	25	"	"	—	—	—
31	1886	Ceci	Genoa	F.	17	Wandering hypertrophied spleen	"	4 lbs. 13 ozs.	—	—
32	"	Nilsen	America	F.	?	Hypertrophy	"	Nearly 2 lbs.	—	—
33	"	Bergmann	Berlin	F.	?	"	Death (?) cause	—	—	—
34	1886	Podrez	—	F.	36	Hypertrophy	Recovery	—	—	—
35	"	Ribera	—	M.	10	"	Death in 24 hours	—	—	—
36	"	McGann	Pittsburg	?	?	Wandering hypertrophied spleen	Recovery	14 ozs.	—	—
37	1887	Cassini	Italy	F.	22	Hypertrophy	"	6 lbs. 12 ozs.	—	—
38	"	Leibman	Trieste	F.	28	Wandering hypertrophied spleen	"	2 lbs.	—	—
39	"	Spencer Wells	England	F.	24	Hypertrophy	"	1 lb. 14 ozs.	—	—
40	"	Polk	—	F.	?	Wandering spleen	"	—	—	—
41	"	Meyers	—	?	?	Hypertrophy	"	—	—	—
42	"	Leonard	—	F.	?	"	"	—	—	—
43	1888	Fritsch	Germany	F.	31	Lymphosarcoma	"	—	—	—
44	"	Spencer Wells	England	F.	21	Wandering spleen	"	—	—	—
45	"	Hatch	Bombay	M.	30	Hypertrophy	Death from shock same day	—	—	First case in Spain.
46	"	Mas	Valencia	?	?	Hydatid	Recovery	—	—	—
47	"	Wright	Manchester	M.	31	Hypertrophy	Death from hæmorrhage in 36 hours	1 lb. 8 ozs.	Bleeding from diaphragm	—
48	1891	Spanton	Hanley	F.	52	"	Death in 11 hours from shock	2 lbs.	—	—
49	"	Tricomi	Padua	F.	?	Wandering hypertrophied spleen	Recovery	1 lb. 8 ozs.	—	—
50	1892	Bland Sutton	London	F.	22	Wandering and rotated spleen	"	1 lb.	—	—
51	"	Tricomi	Padua	F.	32	Hypertrophy	"	2 lbs. 3 ozs.	—	—
52	"	Lindfoss	Christianstadt	F.	20	Wandering spleen	"	—	—	—
53	"	Treub	Leyden	?	?	Hypertrophy	"	—	—	—
54	1893	Reigner	Berlin	M.	14	Injury	"	—	—	—
55	"	Ceci	Genoa	F.	16	Hypertrophy	"	3 lbs. 11½ ozs.	—	—
56	"	"	"	M.	13	"	"	—	—	—
57	1894	Murphy	Sunderland	F.	38	Abscess and hypertrophy	"	1 lb. 8 ozs.	—	—
58	"	Malins	Birmingham	F.	30	Enlarged rotated spleen	"	2 lbs. 5 ozs.	—	—
59	1895	Spanton	Hanley	F.	38	Hypertrophy	"	6 lbs. 4 ozs.	—	—

NOTES ON SPLENECTOMY, DERIVED FROM THE TABLES.

(1) TABLE I.—*Leucocythæmia*: 25 cases (5 males, 20 females); 24 died. Death-rate 96 per cent. The case that recovered (a woman) is considered by Knowsley Thornton to have been one of simple hypertrophy.

(2) TABLE II.—*Non-Leucocythæmic Cases*: 59 cases (6 males, 53 females); 38 recovered; 21 died. Death-rate 35.59 per cent. The following are the details of the table:

	Cases.	Recovered.	Died.
(1) Hypertrophy	33	18	20
(2) Wandering	9	9	0
(3) Rotated	2	2	0

	Cases.	Recovered.	Died.
(4) Lymphosarcoma	2	2	0
(5) Cystic, including hydatid	4	4	0
(6) Other cases, including injury	4	3	1

Death-rates for Each of the last Three Decades (exclusive of *Leucocythæmia*).

	Number of Cases.	Deaths.	Death-rate. Per cent.
1865-75	5	4	80.00
1876-85	20	9	45.00
1886-95	29	6	20.68

The tumour was examined by Dr. S. King Alcock, who reported as follows: "Weight was 6 lbs. 4 ozs. The structure is practically normal throughout, and there is no excess of fibrous tissue, the capsule being exceptionally delicate."

Patient bore the operation well. For the first two hours she was somewhat collapsed. After that time the temperature rose rapidly, and at 6 P.M. was 103° F., pulse 130, perspiring very freely, complaining of severe pain in the region of the spleen. No vomiting. At 9 P.M. temperature 100° F., pulse 124. A hypodermic injection of morphine was given.

March 12th. Passed a good night, slept about four hours; still much pain; passed flatus and urine. Temperature 98.4°, pulse 108; much thirst; ordered enema of warm water.

March 13th. Still much pain, cough troublesome, perspires freely. Temperature 99°, pulse 116. Wound looking healthy and dry.

March 14th. Less pain, taking food well.

March 17th. Very comfortable, hungry; had simple enema which acted well. Pulse 106, temperature 98.4°. Still perspiring freely.

March 19th. Sutures removed, wound quite healed, patient comfortable and cheerful. Temperature 98°, pulse 100.

March 22nd. Evening temperature rose to 103°, and complained of pain in left hypochondrium. No cause could be found. Tongue clean and appetite good.

March 23rd. Temperature again normal and pain gone.

March 31st. Since last note the temperature has risen each evening, ranging from 101.8° to 103.6°, and with this has always been associated pain over the site of the pedicle. From this date the temperature came down to normal and remained so. She rapidly gained strength and flesh, and returned home quite well on April 23rd.

The patient is now quite active, and says she feels better than she has felt for several years.

Remarks.—In this instance the patient had suffered more from actual pain than either of the others, owing to the peritonitis no doubt; and it is of interest to note that this in no way interfered with a satisfactory result. The signs of shock which came on suddenly as soon as I made an attempt to lift up the spleen led me to consider how to free it without dragging on the pedicle, and finding that it was held principally by the suspensory ligament I decided to deal with this first. After the division I was gratified to find that one could lift up the spleen without inducing any further signs of collapse, and it was then possible to reach the splenic vessels without difficulty before their subdivision, as already described. From a physiological point of view it is interesting to mention that a small splenulus was found in the gastro-splenic omentum, which was of course left untouched. One feature very marked in this case was also observed in the other two, the existence of very profuse perspirations before operation, which disappeared afterwards. In the absence of any signs of suppuration and of any marked rigors this is interesting. I cannot explain it. The rise of temperature occurring about the eleventh day after operation has been observed in some other recorded cases and was curious, lasting several days; it was no doubt caused by some inflammatory changes in the neighbourhood of the stump of the pedicle, some localised phlebitis most probably; but this is only what might be expected when one considers how largely the venous element is concerned in it. It serves to enforce the necessity of securing every vessel if possible, a point on which all operators are agreed. This patient is now (July, 1895) perfectly well, and leading a more active life than she has been able to do for the last four years.

Splenectomy has now been performed in this country sufficiently often to enable us to draw some conclusions as to the range of its usefulness. I have endeavoured to tabulate all the recorded cases up to the present time, including many which have already been published in the tables of Collier and Thornton and elsewhere. Mr. T. T. Cockill has traced out for me as far as possible every case which appears in the table; no doubt many operations have been performed which have not been put on record, both successful and unsuccessful, and these must necessarily be left out of calculation. We have, however, 84 cases, and some interesting data can be deduced from them. We find that among the leucocythæmic cases, out of 25 only 1 recovered. It is now generally acknowledged that splenectomy in such

cases is attended with too great a risk to be justifiable. This is not due to any greater difficulty in the operation, but to the gravity of the disease itself, which seems to render any surgical procedure most unsafe. So that we may, I think, accept the dictum laid down in the recent textbooks that in all cases in which leucocythæmia is present splenectomy ought not to be performed.

Among 38 cases of hypertrophy we find 20 deaths after operation. These are the cases which present themselves to the surgeon as causing most discomfort, and seem most to demand surgical interference. The solid mass dragging on the stomach and causing pressure on adjacent organs render life intolerable, and in many of them some form of local peritonitis is set up which adds to the pain and danger.

It will be observed that in all my cases the spleen was of considerable size, much larger than the majority of those I find recorded. In Case III it is much the largest among those who recovered.

It is curious how a solid tumour of this kind, of even moderate dimensions, will cause a much larger amount of discomfort proportionately to a fluid tumour of the same weight. In my third case this was especially marked, as the patient became very ill and emaciated from the constant dragging and distress caused by what proved to be a simple enlargement. As soon as this was removed her general health at once began to improve, and she rapidly gained flesh. This affords a strong reason for removal of the organ, which may be diverting material which ought to be utilised elsewhere.

Of the remaining other conditions for which splenectomy was undertaken we find wandering and rotated spleens; lymphosarcoma; cysts, including hydatid; injury, and abscess.

Taking the last three decades, we have this remarkable result:

During the first,	1865-75	a mortality of	80.0	per cent.
"	second, 1876-85	"	45.0	"
"	third, 1886-95	"	20.68	"

For wandering spleen it would seem quite feasible to adopt splenorhaphy, as we do in cases of wandering and movable kidney. I have not met with any instance which caused sufficient discomfort to warrant the procedure, though I would certainly be disposed to adopt it in a suitable case in preference to the great risk of splenectomy.

With regard to the operation itself, the chief risks appear to be shock and hæmorrhage. In a very large proportion of the fatal cases one or both of these conditions have been the cause of failure. So that our chief aim must be in the direction of averting shock and security against subsequent hæmorrhage. With regard to shock, it is easy to understand why it should be formidable from the intimate connection of the spleen with the large solar plexus, but in most of the recorded cases I find it was first noticed when an attempt was made to remove the organ from the abdomen. In my own cases this was most marked the moment the spleen was pulled upon in the slightest degree; and in my last case I was so struck by this, that it occurred to me that it might be caused as much by the dragging upon the diaphragm as by any interference with the gastro-splenic pedicle. Acting on this hint I decided to begin by dividing the suspensory ligament. This was transixed, ligatured, and set free, and the moment this was done all signs of collapse or shock passed off. I think that this is an important point, for if we can in this way overcome the first tendency to shock and at the same time set free the pedicle proper, one of our chief difficulties is overcome. I found it quite easy to deal with the vessels in the pedicle, and it seemed to simplify the subsequent proceedings wonderfully. It may not be possible to adopt this course in some cases, but I feel sure that when it can be done it will greatly simplify the operation, and enable the vessels to be secured more readily and certainly.

I find in almost all the published records that the suspensory ligament has been dealt with last (as in my own first two cases) and I desire therefore to draw special attention to this matter. Then as to the best mode of securing the vessels, I think no rule can be laid down. Where the splenic artery and vein can be ligatured separately it is a great gain, but more often the vessel divides far before it reaches the spleen, and, as in my first case, a very broad pedicle with many vessels is what we must deal with.

If a double ligature will suffice that is probably the best, taking care after dividing the pedicle to put a separate silk ligature on each open mouth. Some of the deaths from hæmorrhage have been attributed to a "small" vessel slipping from the main pedicle ligature, and the course I suggest will entirely frustrate this danger. At the same time it is very essential to ligature every bleeding point in any adhesions, for everything in this neighbourhood is usually very vascular.

In my successful case, every care was taken to tie any vessels and make everything secure, and yet the operation was completed in a little over half an hour. This, too, is important, not to keep the patient longer than is absolutely necessary under operation, and it is better to make a large incision so that the tumour may be easily removed and there may be ample room for dealing with the pedicle, with as little dragging and disturbance as possible.

When we consider that during the last thirty years, as shown by the table, the mortality with a larger number of cases has been reduced from 80 per cent. to 20.68 per cent. on the published cases, we may I think fairly say that splenectomy has a grand future before it, though the cases in which it must be demanded are few and far between; and it ought not in my opinion to be resorted to unless the patient's condition is such a miserable one as to demand it. Every other resource must be well tried first, though up to the present time the results of medical treatment in cases of true hypertrophy seem to have been most unsatisfactory.

The operation will probably be necessitated only in the case of injury and large tumours, non-malignant, whether solid or cystic; and I can hardly imagine its justifiability with the present rate of mortality, in any cases of small or simple movable spleens.

TWO CASES OF SUPPURATING HYDATID OF THE LIVER, PROJECTING BACKWARD, DRAINED THROUGH THE CHEST WALL AFTER RESECTION OF RIB.¹

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THESE two cases happened to come under my care almost at the same time, and they taught me so clearly the difficulties of diagnosis and of treatment that must always be present when a hydatid of the liver presses upward and backward, but not forward, that I venture to submit them to this meeting. The necessity of saving time must be my excuse for passing over similar cases reported by Mr. Tyson, of Folkestone, and other surgeons.

Instead of relating these two cases one after the other in the usual way, I will put the chief features of each case side by side, hoping in this way to show more clearly the conclusions to be drawn from them.

1. *Previous History of Case 1*—The patient was a gentleman, aged 30; he had lived in England nearly all his life, and had never been in Australia; he lived a quiet temperate life, and he had never had syphilis. His present troubles began seven years ago. He was on that occasion taken ill, somewhat suddenly, with sharp pain and tenderness in the region of the gall bladder, vomiting, and jaundice, and he was laid up for several weeks. He was seen by a physician, who diagnosed the case as one of small calculi or gravelly deposit in the gall bladder; and another medical man, who saw him about this time, was of opinion that the gall bladder could be felt enlarged. From this time onward he was subject to similar attacks, which occurred suddenly and at irregular intervals about twice a year. Between the attacks he was in his usual good health. In some of the attacks he was not jaundiced, but, with this exception, they were all much alike, sudden in their onset, slow to pass away, marked by severe pain and tenderness about the region of the gall bladder, with vomiting; and in the later attacks the pain used

to shoot round to the back and up to the right shoulder. In the autumn of last year (1894) he had an attack of unusual severity, which lasted many weeks; his pain was aggravated by obstinate constipation with accumulation of wind in the bowels. On his recovery he went to Worthing, and was under the care of Mr. Collet there. On December 13th he had for the first time a rigor. On the 21st he had another, and again on the 22nd; and on the 24th there were signs, not well marked, of a slight pleural effusion in front immediately above the liver; about this time also he began to be troubled with sweats, which were sometimes very profuse. But, strange to say, the signs of effusion passed away, and so did the attacks of sweating, and during the greater part of January and the first half of February his temperature was about normal, and he seemed once more convalescent. But on February 14th he again had a rigor, with temperature 102°, and in March his temperature was of a marked hectic character, 101° or 102° every night; he was frequently in pain, and was plainly losing ground.

Previous History of Case 2—The patient, a man aged 50, had served in the army but had never lived abroad. He had, many years ago, had syphilis, and he admitted that he had been given to drink. Two and a-half years ago he had been in the West London Hospital for five weeks; his board had been headed "hepatitis." He suffered on that occasion from pain in the region of the liver, shooting up to the right shoulder; this pain was said to be continuous, not paroxysmal, worse on deep inspiration; he also had pains in the bowels. Shortly before his admission he had been jaundiced. He complained also of pain in his right side, and it was noted that he had some tenderness over the ninth rib, and that there was "a doubtful feeling of fulness" on that side. For three weeks his temperature was of a hectic character, rising to 101° or 102° every night. Then the fever ceased; the pain also ceased, and he left the hospital. For two and a-half years nothing was heard of him. Then he came back, having had a second attack of jaundice, followed by the return of his old pain, and he was admitted into the hospital on May 3rd.

2. *Condition of Case 1 just before Operation*.—This patient, though he did not appear in immediate danger of his life, was very weak and feverish, restless and depressed, suffering from acute lancinating pains not only in the region of the liver, the right side, and the right shoulder, but also up the spine to the back of the head, and down the backs of both thighs to the calves. There was no enlargement of the front of the liver, nor could its edge be felt below the ribs, nor was there any increase of the liver dulness in front. Behind, in the line of the angle of the scapula, there was slight dulness over the lower ribs, from the seventh to the tenth, and the intercostal spaces here felt somewhat firmer than natural. And it is worth noting that when this area was percussed, the patient himself felt a distinct thrill or impulse in the region of the liver. The significance of these signs and of the whole history of the case was pointed out to me by Dr. Douglas Powell, who kindly saw the patient more than once, and made the diagnosis of suppurating hydatid.

Condition of Case 2 just before Operation.—This patient was now desperately ill, having refused operation up to the last moment, and he had taken a great change for the worse in the last twenty-four hours. He was, moreover, in every way a bad patient for operation; he had been given to drink, and though he was only 50, his arteries were atheromatous, and he had marked arcus senilis. Worst of all, there were signs that peritonitis had set in. For eight days his temperature had been ranging from 100° to 103°, and had now fallen suddenly. His tongue was dry, his pulse quick and weak; he was jaundiced; he suffered with frequent vomiting and persistent diarrhoea, and was utterly exhausted. His liver, which had been well below the ribs on admission, was now 3½ inches below them in the nipple line, and its vertical measurement in this line was 6½ inches, but the surface thus exposed did not feel tense, nor did it raise the abdominal wall over it to any marked extent. In the mid-axillary line the dulness began at the lower border of the seventh rib. The breath sounds at the base of the lung were normal. His general condition seemed almost hopeless; his face was drawn, his breathing shallow and painful, his abdomen tense and distended. Dr. Ball, who has kindly let me report

¹ Read in the Section of Surgery at the Annual Meeting of the British Medical Association, held in London, July-August, 1895.