Case No. I.—N. M. S., seen 9-1-17. Weight 157 lbs. Diet on 8-1-17, sweetmeats and ordinary Bengali diet—rice, etc. No sugar. Is at work.

Case No. III.—A. T. B., seen 9-1-17. Weight 110 lbs. Diet on 8-1-17, sweetmeats and ordinary Bengali diet—rice, etc. No sugar. Is at work.

Case No. IV.—M. L., Marwari, seen 9-1-17. Weight 127 lbs. Diet on 8-1-17, sweetmeats and ordinary Marwari diet. No sugar. Is at work.

Case No. VI.—B. D. T., Brahmin, seen 19-1-17. Weight 45½ lbs. Diet—tea, milk 16 oz., 2 eggs, cabbage ¼, carrot 4 oz., potato 4 oz., fish soup 8 oz., fish 4 oz., mung dal 2 oz., rum 3 oz. No sugar.

THE SURGICAL ASPECT OF THE RUPTURED SPLEEN WITH NOTE ON CASES.

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ZUCCARELLI (Sacharelli) in the year 1554 removed a human spleen. However, the operation appears to have fallen into grave disrepute. Pean three centuries later, *i.e.*, 1867, whilst operating for what he thought was an ovarian cyst discovered that he was dealing with a cyst of the spleen, and undismayed performed the first successful splenectomy.

In 1893 Reigner performed the first successful splenectomy for a rupture of that organ. So at least it is reported—(vide *Lancet*, Vol. II, 1913); Jacobson mentions Hatch of Bombay in a case in which death resulted from hæmorrhage due to adhesions after removal of the spleen in the year 1889.

It would be interesting to know when the first *successful* splenectomy for a ruptured spleen was performed by surgeons in the East.

The following cases are published as our experience of what is undoubtedly a fairly common accident requiring immediate surgical interference. Cases 9, 10, and 11 were operated on by Dr. A. J. McClosky, during a period of my enforced absence from duty. To him my best thanks are due.

Case 1.

MULTIPLE INJURIES WITH RUPTURED SPLEEN.

Name.—Tiang Soon.
Age.—38 years.
Residence.—Ampang.
Occupation.—Miner.
Admitted.—4th December, 1915, at 7 P.M.
Died.—5th December, 1915, at 2-30 P.M.

History.—On the day of admission was working in a mine, when a mass of earth fell on him. This was at 4 P.M.

Present condition.—Numerous bruises extending across the upper abdomen, and most marked over the lower left chest and left abdomen. Distinct flattening of chest and fracture of 6th, 7th, 8th, 9th, and 10th ribs obvious. The left knee-joint was opened by a ragged wound on the inner side of the joint.

General condition.—A well-developed, strong Chinaman—the patient was restless, and seemed in great pain. He pointed the left chest as the site of most intense pain. The abdomen was slightly distended, but there was no marked rigidity; no tenderness could be elicited on pressure over the abdominal area. There was slight dullness on the flanks. Pulse strong, 82 to minute; temperature 98·4. Within an hour of admission the pulse went up to 102 and the temperature dropped to 97·7.

Under $CHCl_3$.—Exploratory incision 3″ beneath umbilicus; abdominal cavity found to contain dark blood and clots.

An oblique incision 6″—8″ in the left hypochondriac region following the curvature of the costal margin and about 1″—2″ from this margin was made.

The spleen was found torn at its upper and outer pole; the tail of the pancreas seemed crushed. A pedicle ligature was applied and the spleen removed. An intravenous saline of three pints was given at the outset of the operation. Wounds sewn up in three layers.

Morphia ½ gr. given.

At 2 A.M. pulse 102, patient restless and respirations hurried. At 10 A.M. patient was in great pain at the site of the chest injury. Friction sounds very definite and breath sounds diminished in strength and volume. Respirations 54 to minute, pulse 108. At 2 P.M. respirations still hurried; temperature 102; pulse 124, feeble. Death at 2-30 P.M.

Post-mortem.—The following injuries noted: 6—12th ribs fractured left side, rent in pleura at 9th and 10th very marked, ends of ribs protruding into thoracic cavity. Evidences of acute inflammation of pleura, but no tear of lung.

The pancreas was torn across at its caudal extremity. A slight tear of the left kidney, four parallel rents in the right lobe of the liver which was extremely pale.

Case 2.

RUPTURE OF SPLEEN.

Splenectomy—Recovery.

Name.—Lin Que Tian.
Age.—44 years.
Date of admission.—4th August, 1914, at 4 P.M.
Occupation.—Contractor.
Residence.—Kepong.

Discharged.—10th September, 1914.

History.—A poorly nourished Chinaman was brought in at 4 P.M. with a history of having been assaulted at 8 A.M. that morning.

Condition on examination.—Patient was rather collapsed, with a feeble pulse of 114 to 120 per minute. He was complaining of abdominal pain and general weakness. He was restless, and there was a good deal of abdominal distension with dullness in the flanks. Bruises on the 9th, 10th, and 11th ribs.

Under $CHCL_3$.—An exploratory incision revealed the presence of a large quantity of free blood mixed with clots in the abdominal cavity.

An oblique incision 8″ to 9″ long and parallel to the left costal margin, about 1″ to 1½″ from it, was made. A large spleen with an internal tear 2½″ to 3″ long was delivered through this opening. The pedicle ligated, and the individual vessels tied—both wounds brought together in three layers—after several large clots were emptied from the abdomen. An intravenous saline three pints was given at the time of operation. Weight of spleen 31 oz.

At 8-30 P.M., *i.e.*, two hours after the operation, pulse was 140 and respirations 28, temperature 99·8. The next morning 98, temperature normal. On the second day after operation the patient was more or less comfortable except for an asthmatic attack to which he was subject and a stitch abscess, recovery was uneventful and he was discharged just a month and a few days from the date of the assault.

Points of interest.—(1) The duration of the hæmorrhage, *i.e.*, 8 hours. (2) The spleen was adherent by its anterior pole to the diaphragm. (3) Quick response.

Case 3.

RUPTURE OF SPLEEN.

Splenectomy—Death—Pulmonary Tuberculosis.

Name.—Yap Sia.
Age.—40 years.
Occupation.—Cooly.
Residence.—Kuala Lumpur.
Date of admission.—12th April, 1915, at 6-40 P.M.
Date of death.—16th April, 1915, at 6-30 P.M.

History.—A deaf Chinaman, very emaciated, said to have been knocked down by a gharry just a quarter of an hour earlier. On examination several superficial bruises on the face and lip, and one broad bruise 6″ long across the upper abdomen. His temperature was normal, pulse 112, respirations 24. There was marked tenderness over the left costal margin. Clear urine was drawn off and a few drops of blood noted at the meatus. Condition on the whole satisfactory.

Right and left lungs indicated some old trouble. At 3 P.M. the next day the patient seemed to have a great deal of abdominal pain with retention of urine. The pulse was 120, respirations 36.

Under $CHCL_3$.—At 4 P.M. an exploratory incision revealed blood and blood clots. The bladder was uninjured.

The usual oblique incision revealed a very badly ruptured spleen which was removed. The spleen (12 oz.) was almost torn in two.

The course after the operation pointed to chronic lung trouble and T. B. was demonstrated on the third day after operation. The patient gradually sunk and died on the 16th, four days after operation.

Notes of interest.—(1) An extensive rupture of spleen with indefinite symptoms for 22 hours. (2) Resistance of a chronic tubercular subject. (3) Indefinite bladder symptoms.

Case 4.

STAB WOUND OF SPLEEN.

Recovery.

Name.—Ahmat.
Age.—20 years.
Occupation.—Police Constable.
Residence.—Malay.
Date of admission.—3rd April, 1915, at 2-30 A.M.
Discharged.—7th May, 1915.

History.—Young, muscular, strongly-built Malay, was stabbed two hours before he was seen. A coil of intestine was protruding from 2″wound in the left flank below the costal margin. He was not much distressed, but was obviously suffering from shock. He had several superficial stabs on the arm and the back.

Under $CHCL_3$.—The original stab wound was enlarged, and a free examination was made of the small and large intestines and stomach. As there was free bleeding from somewhere a median supra umbilical incision was made, and the spleen was felt to be the cause of this condition. The median incision was connected up with the lateral wound, and the spleen (quickly) removed.

This organ revealed a stab on the external, surface with another much smaller on its internal about ½″ from the hilum and the splenic vessels. Weight 10 oz. Recovery was uneventful, and the patient was up on the 21st day. The patient is now doing police duty.

Points of interest.—(1) Rarity of injury, *i.e.*, stab of spleen. (2) Escape of intestines. (3) Absence of signs of hæmorrhage though abdominal cavity was full of blood.

Case 5.

MULTIPLE INJURIES.

Exploratory Laparotomy.

Name.—Kun San (Chinese male).
Age.—18 years.
Occupation.—Ticket Collector.
Residence.—Kuala Lumpur.
Admitted.—4th January, 1915.
Discharged.—30th May, 1915.
History.—A young, healthy Chinese, was knocked down and run over by a motor car two hours previous to his admission.

Condition.—Patient was semi-conscious and was a mass of bruises, one over the 9th, 10th, and 11th ribs, left chest, attracting attention; a fairly profuse hæmorrhage from the left ear was traced to a laceration of the pinna. A large lacerated wound exposing the tendons and fracturing the phalanges of the great second and little toes of the left foot was seen. The abdomen was distended and dull on percussion. The patient was semi-conscious, and had a good pulse. However, it was decided in view of previous experiences to make certain of the spleen, and an exploratory laparotomy removed any anxiety on that score.

After-history.—The left foot became septic, and the toes were removed after becoming gangrenous.

The abdominal incision healed, and the stitches were removed on the 12th day.

Notes.—(1) Dullness of abdomen and distension. (2) Bruise over splenic area. (3) Good pulse. (4) Laparotomy had no ill-effects.

Case 6.

RUPTURE OF SPLEEN AND LUNG.

Fracture of Ribs—No Operation.

Name.—Ah Thy Moi (male).
Age.—44 years.
Occupation.—Physician.
Residence.—Kuala Lumpur.
Admitted.—14th September, 1915, at 5 P.M.
Died.—6-40 P.M. the same day.
History.—Run over by a motor car at 4-20 P.M. A thin emaciated subject. Bruising of chest with fracture of 6th and 10th ribs on left side, 3rd, 4th, 5th, 6th, and 10th on right side. Bruises over 10th and 11th ribs, and also on right arm.

Condition.—Pulse 120, respirations 30, temperature 90·2 at 6 P.M. Pulse 164, respirations 40, very restless at 6-30; condition worse, patient unconscious, at 6-40 death.

Post-mortem.—The right lung was lacerated in two places, and the right thorax contained at least 10 oz. of blood.

The abdomen was full of blood and the spleen which only weighed 4 oz. was lacerated at the hilum and also at its external aspect.

Points.—(1) Laceration of right lung only. (2) Rupture of spleen in two places. An external rupture is generally due to direct and severe injury.

Case 7.

RUPTURE OF SPLEEN.

Death from Peritonitis.

Name.—Nap An (Chinese).
Age.—33 years.
Admitted.—14th February, 1916, at 11-30 A.M.
Occupation.—Mining cooly.
History.—The patient was sent in by the police as a case of suspected poisoning. At about 10 A.M. he was arrested by the police after having had a meal of rice, etc. He stated that he was kicked by a policeman at the time of his arrest over the mid-axillary region.

At 11 A.M. he was given an emetic (Zinc Sulph.) and vomited a lot of rice. However, he complained of great pain over the lower part of the left chest.

At	11	a.m.	pluse was 84.
,,	12	noon	,, ,, 108.
,,	1	P.M.	,, ,, 110.
,,	2	P.M.	,, ,, 110.

Passed urine but no blood, fæces also semi-solid motion.

Patient admitted having taken sampsu.

At 3-30 P.M. he was in great pain and his pulse rose to 120, respirations 30. At 6 P.M. when I saw him, he was collapsed, feeble running pulse 130, anxious expression. The lower abdomen was dull and suggested blood. Had severe abdominal cramps, which, however, I did not see at my examination.

Under $CHCl_3$.—An intravenous of two pints having been given, an exploratory incision revealed a large quantity of fluid blood, which gushed out of the abdominal cavity, as if it was under great pressure. The usual splenectomy incision revealed an enlarged spleen with a 3" tear on its inner and upper pole. A certain amount of difficulty was experienced in delivering the spleen through the abdominal wound. The tail of the pancreas was intimately adherent to the hilum and was separated with difficulty after a preliminary ligature. The wound was sewn up in three layers with four large all-through stitches (No. 6 silk).

15-2-16. The patient had a restless night. At 8 A.M. complained of pain at the site of operation. Temperature 97·8, pulse 112. Towards evening vomited, was restless and complained of great pain at the site of operation. At 8 P.M. pulse 144, was very rapid; temperature 100·8, and there was abdominal distension. A drainage tube was inserted at the

lower wound. A large quantity of blood-stained fluid escaped. Great relief, however, was experienced and the patient's condition next morning was satisfactory. He had slept well. Towards the afternoon of 16th severe abdominal pain and distension started at 4 P.M. I opened the abdomen again. The splenic incision revealed a very septic condition, the muscles and fascia had sloughed in the short interval of 48 hours. An evil-smelling pus escaped and general peritonitis was evident.

Intestinal siphonage through the cæcum, irrigation of the abdominal cavity, and two extra tubes to assist drainage were inserted. At 8 P.M. patient was cold, running pulse and very restless. Death at 3 A.M., two days and seventeen hours after operation.

Points.—(1) Death from general peritonitis, cause unknown. Site of infection the wound. (2) Presence of accessory spleen. (3) Sudden spasms of pain.

Case 8.

RUPTURE OF SPLEEN.

Death from Cardiac Failure.

Name.—Chin Che Ah.
Age.—35 years.
Occupation.—Gardener.
Admitted.—18th May, 1916, at 10-30 P.M.
Died.—19th May, 1916, at 7 A.M.

History.—Brought in by the police with a history that he had been assaulted by some other Chinese. A few bruises on the dorsum of the right hand and the small of the back. At 4-20 A.M. patient restless and complaining of abdominal pain. Abdomen distended, full and dull on percussion, pulse very feeble and 136 per minute, patient conscious. Cardiac murmurs. Diastolic.

Under $CHCl_3$.—Abdomen full of blood, usual oblique incision, spleen not adherent, two ruptures on inner surface. Pedicle ligated separately and then together. Patient collapsed suddenly at termination of operation and died. Intravenous three pints administered throughout operation. Spleen 14 oz. friable two tears, and one through hilum.

Post-mortem.—No other injuries and disease except dilatation of left heart. A ventricular opening admits 3″ fingers. Death was undoubtedly accelerated by this condition.

Points.—(1) No external injury. (2) Full stomach. (3) V. D. heart as noted before operation. (4) Syncopal attack ending fatally.

Case 9.

RUPTURE OF SPLEEN.

Name.—Thun Phan (Chinese).
Age.—27 years.
Occupation.—Cooly.
Admitted.—30th July, 1916, at 10-50 A.M.

History.—Was assaulted at 7-30 A.M., and received several blows with fists. He then fainted. He had had some congee about 7 A.M. No vomiting.

Condition.—Small well developed subject. Slight bruise over 9th rib left side in mid-axillary line, very restless, pulse 104. Complains of pain over the whole abdomen, body cold.

Operation.—12-30 P.M.

Under $CHCl_3$.—(Dr. McClosky.) Supra-umbilical incision, with another at right angles to first. Spleen 12 oz. 2″ tear at upper and inner surface. One and a half pints saline left in abdominal cavity.

Subsequent progress.—

30-7-16. Passed urine and fæces at 9 P.M. Restless till inject:
Morph. M 5 given. Pulse 130. Temp. 100.

31-7-16. Blood examination. No malarial parasites.
Hæmoglobin 70 per cent.

Diff. count.—

Poly Morp.	...	76 per cent.
L. M. ...	...	4 „
S. M. ...	...	19 „
Eosin.	...	1 „

Red blood cells 3,372,000 P.C.M.

31-7-16. Restless, pulse 130, temp. 101. Rectal saline two pints. Passed fæces at 8 P.M. Slept for a few hours.

1-8-16. Quiet, pulse 110, temp. 98·6, inclined to vomit. Looks better, has pain over site of operation area.

3-8-16. Pulse 108, evening rise of temperature to 100. Slept for a few hours. Bowels opened.

5-8-16. About the same. Evening rise of temperature, dressings removed but parts found in good condition, no suppuration.

7-8-16. Temp. 98·8, pulse 98, bowels moved once, is hungry.

Blood count.—

Poly Morp.	...	51 per cent.
L. M. ...	...	11 „
S. M. ...	...	35 „
E. ...	...	3 „

R. B. C. 3,425,000 P. C. M

14-8-16. Has had an irregular temperature during the past few days, due very probably to a stitch abscess. Stitches removed on 10th day, and a small abscess found near centre of incision. Patient quite comfortable and anxious to walk about.

Blood count.—

Poly.	... 54 per cent.	
L.M.	... 7 „	
S.M.	... 34 „	H. I. 70 per cent.
E.	... 5 „	R. B. C. 3,712,500.

21-8-16. During the past few days the patient has been dull, apathetic, and does not appear to pick up as well as he should. There is no thirst. There has been an irregular temperature during the past two days.

22-8-16. H. per cent. 65 per cent. R. B. C. 3,525,000.

Poly.	... 58 per cent.	
L.M.	... 9 „	
S.M.	... 31 „	
E.	... 2 „	Weight 86 lbs.

30-8-16. An irregular temperature still observed, but after a week's arsenic appears brighter. The blood count shows an improvement from last week.

H. per cent. 70 per cent. R. B. C. 3,818,750.
P. 52 per cent., L. M. 10 per cent., S. M. 34 per cent., E. 4 per cent.

7-9-16. H. per cent. 80 per cent. R. B. C. 3,650,000.

P. 51 per cent., L. M. 9 per cent., S. M. 31 per cent., E. 3 per cent.

The patient is ever so much better. No temperature, increase in weight of 4 lbs., given arsenic for the past week, is up and about.

11-9-16. Blood changes about the same. Discharged.

Case 10.

RUPTURE OF SPLEEN.

Name.—Lee Chin Chang (Chinese).
Age.—24 years.
Occupation.—Clerk.
Date of admission.—2nd August, 1916, at 11-50 P.M.

History.—A young healthy Chinaman. The patient was struck over the abdomen in a struggle with another Chinaman, who used his fists only. This occurred at 9-30 P.M., two hours previous to his admission. He vomited shortly after receiving the injury, having had a full meal at 6 P.M.

Condition.—Beyond a bruise on the right shoulder no external signs of injury can be detected. There is pain all over the abdomen, which is not rigid, and there is no definite dullness to be detected. An hour later the pain increased and the pulse counted 116 with respirations 28 per minute; cold, at 1-30 A.M. had a solid motion, distension of abdomen with dullness in the right flank.

Operation under $CHCl_3$.—Oblique incision (Dr. McClosky). Spleen 10 oz.

Two parallel tears on inner surface, one through the hilum to the anterior border almost dividing the spleen into two halves. The upper tear 2" was not very deep.

Subsequent progress.—Blood. No parasite.
R. B. C. 4,906,250.

Blood count.—

Poly.	... 87 per cent.	
L.M.	... 6 „	H. per cent. 70 per cent.
S.M.	... 6 „	

4-8-16. Vomited, temperature 98·4, pulse 108, respiration 20. Urine passes. Slept about two hours. Pain at side of operation.

5-8-16. Temperature 98·8, B. O. scanty.

6-8-16. Temperature 98·8. Pulse ; B. O. three hours after Ol. Ricini, patient states that he is feeling comfortable.

9-8-16. B. T. parasites in blood.

Blood count.—

P.M.	... 70 per cent.	
L.M.	... 11 „	
S.M.	... 17 „	
E.	... 2 „	Hæmoglobin percentage 75% R.B.C. 4,006,250.

Diminution of R.B.C. probably due to malaria.

13-8-16. Stitches removed. Patient very much improved and convalescent.

16-8-16. Improvement maintained, patient up and about.

Blood count.—

P.M.	... 69 per cent.
L.M.	... 8 „
S.M.	... 20 „
E.	... 3 „

R.B.C. 4,593,750, an increase of half a million. H.I. 85 per cent.

19-8-16. Discharged.

28-8-16. H. Value 80 per cent.
R.B.C 4,962,850.

Leucocyte count.—

P.	... 53 per cent.
L.M.	... 13 „
S.M.	... 32 „
B.	... 2 „

Patient is at work.

Case 11.

RUPTURE OF SPLEEN.

Name.—Lye Kong Thoon.
Age.—26 years.
Occupation.—Domestic servant.
Admitted.—19th August, 1916, at 11-30 P.M.

History.—Had a full meal about 10-30 A.M. and then went to the lavatory, where he fell down a flight of steps, a height of 8 feet. He fell on his left side. A bruise on the left cheek, however, was the only mark seen. He vomited almost immediately. He walked to his room and lay down with a pain over the left flank. The pain increased till it extended over the whole abdomen which felt very distended. At 3 P.M. he passed

urine and fæces and vomited repeatedly. At about 10 P.M. he felt dozed and giddy and the pain was more marked. His master then saw him and immediately sent him to hospital.

Condition on admission (11-30 P.M.)—A well-nourished young Chinese adult, rather restless and asking to be allowed to sit up. There was general tenderness and pain over the abdomen with dullness in the flanks and hypogastrium. Pulse very feeble 1-48 P.M. and respiration 30. The swelling in the hypogastrium resembled a distended bladder, but a catheter failed to draw off any urine. So marked was this swelling that a suspicion of rupture of that organ was entertained.

Operation at 2 a.m. under $CHCl_3$.—A median incision in the hypogastric region showed the bladder to be healthy and an enormous escape of blood with clots pointed to the spleen. An oblique incision over the left hypochondriac region, and the removal of a badly ruptured enlarged spleen followed. The abdominal cavity was washed clear of blood and clots, and saline two pints was left in. The wounds were then closed in three layers. The spleen weighed 24 oz. and showed a very large tear transversely through the hilum, with another oblique tear extending upwards. The tear through the hilum extended across the whole diameter of the organ which was very friable and soft.

Subsequent progress.—The patient was much collapsed after the operation. An intravenous saline of four pints was given, but the pulse was very thready and the respirations shallow. At 4 A.M. vomited. Conscious at 11 A.M., pulse 126, remained drowsy all day. On the 20th night restless and hiccoughing. Passed urine, pulse 126.

Blood count.—

Hæmoglobin per cent.	... 70 per cent.
R. B. C.	... 2,937,500
L. C.—P. M.	... 68 per cent.
L. M.	... 15 „
S. M.	... 17 „

22-8-16. Beyond hiccoughing is fairly comfortable, pulse 118. Has pain at site of operation. Tongue dirty.

24-8-16. Bowels moved after calomel. Slept five hours. Is comfortable.

28-8-16. Stitches removed. Minute abscess at lower margin of incision.

31-8-16. Temperature ranging from 100°—103° during past two days. Blood negative for malaria—count 29th shows a marked increase of red cells and the presence of nucleated red cells. H. I. 70 per cent. R. B. C. 3,987,500.

P. 50%. L. M. 10%. S. M. 33%. E. 8%.

7-9-16. Temperature has continued for four days. At present, however, there is a marked improvement and the patient is able to move about. There is a diminution in the R. B. C. count and hæmoglobin percentage due to the fever.

Patient is now convalescent.

Case 12.

RUPTURE OF HEART AND SPLEEN.

Name.—Chan Sang.

Age.—12 years.

Runover by a motor car at 1-30 P.M.

Condition.—At 2 P.M. extremely restless, pulse about 140, only felt at elbow. Respirations sighing. Loud rhonchi heard over both lungs. Hyper-resonant and changing to dullness on shifting from side to side.

Distinct depression over the left chest which was bruised.

Dullness in the flanks, but not very definite.

Increasing pallor noted and patient very restless, throwing himself from side to side. Respirations more prolonged and increasing, clamminess with unconsciousness terminated in death at 2-30 P.M.

Post-mortem.—A small rupture of the left ventricle at below the auriculo-ventricular orifice, about the size of a five cent piece and oval in shape, was noted together with a rupture of the pericardium. The second right rib was fractured, but there was no other fracture. Great bruising of the pectorals and extravasation of blood into the cellular tissue were obvious. The lungs were emphysematous. Rupture of the spleen at hilum, slight escape of blood in abdominal cavity.

Remarks.—(1) In this case the respiratory symptoms were very marked. (2) Increasing pallor and restlessness suggested hæmorrhage which, however, was mainly from the heart though there was a rupture of the spleen.

Symptoms.—In some cases there are none, at any rate they seem delayed till too late. Pain appears to be a constant symptom, either over the splenic area, but more commonly over the whole abdomen. The character of this pain varies, and it may result from mere over-distension, or it may be spasmodic in character. In one case observed these spasms of pain in the gastric region suggested a stomach lesion. Lejars mentions a case in which there was a hæmatoma in the gastric-splenic omentum resulting from a slight tear in the posterior margin of the spleen. The case was a long-standing one (twelve days).

We have observed the same symptoms in a European.

Laparotomy on the 38th day after the injury revealed the same condition as mentioned by Lejars. Operative procedure before this date was refused by the patient. The remaining symptoms are those associated with internal hæmorrhage, none of which are characteristic of splenic

rupture. The existence of an external bruise over the splenic area is as valuable as it is uncommon. In No. 7 of the series, the heel of a policeman's boot was neatly marked out on the skin and provided, in combination with his other symptoms, a straightforward diagnosis of the condition. Fracture of the 8th, 9th, and 10th ribs on the left side should always cause suspicion of deeper mischief. The symptoms may be entirely masked for some hours after the initial injury, and this symptomless interval has certainly contributed largely to errors in diagnosis and above all delay in adopting operative measures. No. 3 of the series is a case in point. He slept well, and at 8 A.M. was sitting up and enjoying his food. 22 hours after the injury he showed signs of internal injury, and in his case the spleen was almost completely divided into two equal pieces.

INTERVAL BETWEEN INJURY AND OPERATIVE MEASURES.

In the following table will be seen the intervals between the injury and the surgical assistance.

Rupture.	Multiple injuries.	Interval.	Result.
(1) Simple rupture.	Lung, pancreas, ribs, and spleen.	3 hours.	Death next day 2-3 p.m.
(2) Simple rupture of spleen.	.....	8 hours.	Recovery.
(3) Simple rupture of spleen.	... ..	22 hours.	Death from P. T. after 4 days.
(4) Stab wound.	Incised wounds on chest.	2½ hours.	Recovery.
(6)	Spleen, lungs, and ribs.	2 hrs. 20 min.	Death. No operation.
(7) Simple.	.....	8 hours.	Death.
(8) Simple.	.....	7½ hours.	Death.
(9) Simple.	.....	5 hours.	Recovery.
(10) Simple.	.....	3 hours.	Recovery.
(11) Simple.	.....	12 hours.	Recovery.

The longest interval was 22 hours and the shortest about three hours.

SITE OF RUPTURE.

In only two of the nine cases reported was the tear on the external surface of the organ, whilst the rupture was on the internal surface in the remaining seven.

In the above two cases multiple injuries to the lungs and other viscera were noted. Both cases were fatally injured as the result of great violence—one by a great mass of falling earth, and the other was hit by a motor car, and then run over, the car was travelling at a great peace.

The frequency of an internal rupture, or ruptures in the vicinity of the hilum, has been demonstrated most ably by Colonel Crawford in his "Notes on the Rupture of the Spleen" (Vol. XLI, page 89, *I. M. G.*). We think that when a tear on the external surface is met with, the injury has always resulted from extreme violence, and is generally associated with multiple injuries to other organs.

That a full stomach increases the liability to rupture is generally admitted, the stomach acting, we suppose, as a sort of internal splint to the spleen and resisting any displacement towards the middle line, other physiological factors also contributing.

In cases 7, 10, and 11 a history of a full meal was obtained, and also a history of vomiting after receiving the injury. In view of this vomiting, an empty stomach found *post-mortem* would not be of much significance. No. 7 was given an emetic before admission as the police stated that the man had poisoned himself.

2. *Nature and violence of injury necessary to cause a rupture.*

The force necessary to cause a rupture of the spleen, depending on so many outside factors, must be difficult to determine. Of the nine cases in which a rupture occurred two were the result of very severe injury, five received blows with fists, one was kicked, and one fell from a tree, a height of 8 feet. It is with great diffidence that we mention an experiment we tried of dropping spleens from a height of 6 feet.

We are fully aware of the many drawbacks and possible errors of the experiment, and trust that our readers will not take any steps to point them out. The simplicity of the test must be its chief attraction.

Out of 300 spleens thus tested, 140 were ruptured, and 160 were Tamils and 100 Chinese. On classifying the diseased conditions the following results were obtained:—

		No.	Ruptured.	Not ruptured.
1.	Respiratory Diseases ...	60	34	26
2.	Circulatory „ ...	38	24	14
3.	Renal ... (Stab Wounds, etc.) ...	17	9	8
4.	Traumatic ...	21	5	16
5.	Malaria Fever ...	24	20	4
6.	Intestinal Diseases ...	52	16	36
7.	General:			
	(*a*) Hepatic Cirrhosis	6	2	4
	(*b*) Malignant Growths	3	2	1
	(*c*) Beri-beri ...	12	6	6
8.	Cerebral	17	6	11

This classification, owing to the multiplicity of diseases in the one subject is purely arbitrary. The malarial fever cases were chiefly cerebral cases and were all acutely ill on admission.

THE OPERATION.

This will be described under the following:—

(*a*) Incision. (*b*) Dislocation of spleen. (*c*) Delivery of spleen. (*d*) Ligature of pedicle.

(*a*) *Incision.*—An oblique incision from the outer margin of the left rectus running parallel to and about 2″ from the costal margin for a distance 5′ to 6″ was used in the majority of the cases. Care should be exercised not to get too

near the costal margin as owing to retraction of the muscles great difficulty will be experienced in suturing up the wound. If possible, section of the rectus should be avoided.

(*b*) *Dislocation of the spleen.*—Having satisfied oneself as to the presence of a rupture, the spleen is separated from its position under the diaphragm. Adhesions may give rise to trouble, but as the case is an emergency they should be separated as soon as possible, and any oozing dealt with after its removal—a hot pad or pads packed in the space recently occupied by the spleen should not be forgotten.

(*c*) *Delivery of spleen.*—Once out of the wound—hæmorrhage can be immediately controlled either by traction on the spleen or by pedicle clamps. The lino-renal ligament and gastro-splenic omentum and accessory adhesions are not dealt with. In applying the clamps care should be taken not to include a part of the stomach or the tail of pancreas.

(*d*) *Ligature of the pedicle.*—A dissection of the peritoneal covering of the pedicle gives a clear view of the splenic vessels, which can be dealt with separately or *en masse*. Ligating the pedicle in sections is safer, with one large pedicle ligature below to give extra confidence. An intravenous saline infusion either just before, certainly during, and if necessary after, the operation is very helpful. The best description of the technique of splenectomy is to be found in the July number of *Surgery, Gynæcology and Obstetrics*. It is written by D. C. Balfour, M.D., Rochester, and contains some excellent illustrations to assist a very clear account of the operation.

Effects of Removal.

In case 2 no change was noted. Convalescence was unmarked by any unusual symptoms. Duration of stay in hospital five weeks.

Case 4 the stab wound, case was up and about on the 21st day, a rapid return to normal was observed in his red blood cell count and hæmoglobin per cent. He returned to police duty six weeks after his operation.

Case 9 presented some of the symptoms mentioned by other observers. He became listless, apathetic, and very drowsy.

An irregular temperature could not be accounted for.

The patient stoutly denied the suggestion of opium eating or smoking, as the drowsiness and apathy were so marked as to indicate the use of this drug. However, these symptoms disappeared after a week on arsenic.

A diminution in the red cell count, a diminished hæmoglobin percentage were noted in 9, 10, and 11, though an improvement every week was observed.

No. 10 had a slight evening rise and his blood showed benign tertian parasites on the seventh day after operation.

No. 11 also showed wasting, general apathy, and drowsiness.

An irregular temperature, with no definite cause to account for it, started on the tenth day after operation and lasted for four days. Tenderness over the bones, enlargement of glands, griping pains in the abdomen, and thirst are mentioned after splenectomy. None of these symptoms were noted in the series published.

No. 7, having provided a source of recrimination and remorse in the manner of his death, *i.e.*, from general peritonitis, proceeded to supply an accessory spleen at his *post-portem!*

Mortality.

Lejars quoting E. Berger's paper says: "We find 67 cases of splenectomy for ruptures with a mortality of 43·3 per cent.

The author has collected 127 cases of laparotomy for ruptures and wounds of the spleen in which the general mortality is 41 per cent., and the mortality of 80 splenectomies 43·7 per cent. It is to be noted that here again the co-existence of other visceral lesions makes the prognosis more serious. The mortality rose to 51 per cent. for complicated cases."

There were five recoveries in our series, but it would be hardly accurate to work out a mortality rate on such a small number of cases, *i.e.*, 9, which were operated on.

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Surgery, Gynæcology, and Obstetrics. July, 1916.

GANGOSA.

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Gangosa or rhino-pharyngitis mutilans is a disease which is likely to be mistaken for syphilis or leprosy.

The name is derived from the Spanish word "Gangosa" meaning a nasal voice, and the disease is so called because of the peculiar nasal character of the voice which the persons afflicted with the disease develop on account of the naso-pharyngeal ulceration which takes place.

Gangosa was first described in 1828 by Don F. Ruiz de Villalobos of the Spanish Commission which visited the Ladrone or Mariana Islands in the Pacific Ocean for investigating the diseases prevailing there. In 1904, it was specially studied by Leys in Guam, one of the Ladron