+

C. J. Evans

Clinical observations on enlargements of the spleen & their diagnostic significance & pathology

I have chosen this subject for two reasons

Firstly because I have seen several cases lately of various kinds of enlargements of the spleen which were of great interest from a clinical as well as from a pathological point of view.

Secondly because of the interest of the subject in view of the amount of work which has lately been devoted to the pathology of splenic diseases.

I may say "en passant" that the spleen although a comparatively large organ with a copious blood supply is apparently not essential to life. For it has been extirpated both in animal

and man without obvious ill result.
Nevertheless we cannot believe but
that the spleen must of necessity
have some important function
at present unknown.
The spleen is one of the so-called
ductless glands. others being the
lymphatic glands. thyroid, thymus,
supra-renal & pituitary glands.
as to the thyroid, pituitary and
suprarenal glands these are
evidently secretory or secretory in
function, and are concerned in
the general metabolism of the body.
The function of the lymphatic glands
situated as they are in connection
with lymphatic vessels is fairly
obvious. The function of the spleen
however we are entirely in the
dark about, Nevertheless its
structure does not suggest that
it has a secretory function but

rather from its free connection with the circulatory system that it has some influence on the blood.

As has already been stated the spleen is not essential to life; that it has a function cannot reasonably be doubted & the natural conclusion to draw is that when removed compensation is in some way effected by other organs and indeed the lymphatic glands have been found to enlarge after removal of this organ.

In connection with enlargement of the spleen I shall point out that the organ may be found considerably enlarged even when not felt below the ribs and indeed enlargement of this organ is very often overlooked. The examination of the spleen should be systematically undertaken

in all doubtful cases as it frequently gives us a valuable hint when, perhaps, least expected. The early recognition of this enlargement may lead one to examine the blood carefully and thus enable us to explain certain symptoms which would otherwise have a doubtful meaning.

Many illustrations of this could be given but I think the following will suffice:—

In September last a woman 43 years of age with pale sickly complexion came as an outpatient to the Cardiff Infirmary. She was complaining of profuse haematemesis. There was no pain after food or other gastric disturbance, nor indeed any pain or tenderness of the abdomen and no evidence of cirrhosis of the liver

On examination, however, both the spleen & the liver were decidedly enlarged. Examination of the blood showed no leucocytosis but there was marked diminution of red blood corpuscles - in fact a state of severe anaemia.

Before she could be admitted as an inpatient she died of sudden profuse haematemesis. No post mortem examination could be obtained but I think it cannot be doubted that this was neither a case of gastric ulcer nor cirrhosis of the liver. It was one of those forms of splenic anaemia about which so much has been written and so little is actually known. Instances may be multiplied to show the importance of a careful examination of this organ such as in doubtful cases of typhoid

fever as well as in those cases in which the spleen may possibly be enlarged from causes of a primary nature.

From a physiological point of view the clinical study of splenic diseases throws as much light on the possible function of the spleen as do experiments carried out in the physiological laboratory.

Some of the cases of splenic enlargement which I have lately met with have been of peculiar interest from many points of view and have impressed upon my mind that the classification of diseases of this organ is far from satisfactory and also that the diagnosis of the cause of such enlargements is in many cases most difficult to determine.

I

Physical examination of the spleen

I wish to draw attention here to the following facts.

I That the spleen may be considerably enlarged and yet not palpable.

II That by taking certain precautions it is often possible to feel a spleen that might otherwise escape detection.

III That the spleen may be palpable and yet not enlarged.

IV That there may be no dulness over the splenic area as the organ may be prolapsed – being freely moveable in the abdomen.

It may be taken as a general rule that the spleen when palpable is enlarged but such enlargement should also be corroborated by careful percussion and indeed percussion may show an enlargement when the organ is not palpable.

Examination of Splenic enlargement.

Inspection Enlargement or prominence of the left side of the abdomen is obvious, when the spleen is much enlarged or there may be great enlargement of almost the whole abdomen though more marked on the left side as in one of the cases I shall mention in which also there was marked ascites.

Palpation This is very important and sometimes must be most carefully conducted before arriving to the conclusion that the spleen is not palpable. Indeed it has often struck me how medical men will differ as to whether the spleen is enlarged or not and I think these differences can often be explained by want of sufficient attention to the detail and method of examination.

Again a resistance may be felt which

often gives rise to doubt as some may say they believe the spleen is enlarged while others say that it cannot be definitely felt and that there is therefore no real enlargement.

It is in such cases as these that careful percussion may be of use and also certain precautions in the method of examination.

In doubtful cases the following method may be employed and attention to each slight detail is of the utmost value.

The patient should have the shoulders raised and the knees slightly bent: attention diverted, mouth slightly opened and be told to breathe comfortably.

The Physician stands on the right side of the patient, sees that his hands are warm, puts the right

hand flat on the abdomen on the left hypochondrium. The left hand should be placed at the back of the ribs of the left side pressing gently but firmly forwards. The right hand should then be gradually pressed beneath the costal arch and the patient told to breathe deeply. The right hand should be pressed in during respiration and upwards and backwards as far as possible. The patient should be told to take two or three deep breaths and the spleen will most probably be felt if enlarged. If the spleen is not felt in this posture the patient should be turned on the right side and the same method of examination followed.
This latter position may make the spleen palpable when otherwise

not. felt.

Percussion should always be carried out in a complete examination of the spleen and although less important than palpation it may occasionally show us that the spleen is actually enlarged – the normal splenic dulness being exceeded.

The percussion limits of the normal spleen are as follows:-

The vertical extent is from the upper border of the ninth rib to the lower border of the eleventh.

The anterior border is in the mid-axillary line.

The posterior border which is more difficult to obtain is about $1\frac{1}{2}$ inches from the vertebral spines.

The area of splenic dulness is thus about $3\frac{1}{2}$ inches in length and about $2\frac{1}{2}$ inches in breadth.

When these limits are decidedly

increased even though the spleen is not palpable below the costal arch it may be assumed that the spleen is enlarged, so the examination of the blood should at once be undertaken and the spleen should be carefully palpated for at intervals.

General characters of Splenic enlargements

The enlarged organ is firm, hard, and smooth to the touch and presents a well-defined notch on its anterior margin. It moves slightly during forced respiration, being pushed downwards on inspiration by the descending diaphragm and retreating during expiration.

In connection with percussion though a splenic tumour is usually dull it occasionally happens in cases of distention of the intestines that a more or less resonant note

is obtained over it.

If a sharp notch can be felt on the anterior border of the tumour this is practically conclusive evidence that the tumour felt is a splenic one

Differential diagnosis

I From a renal tumour.

A renal tumour is situated in the loin, the descending colon being in front of it. There is no resonance behind it and its outlines are never sharp; when the hand can be got above it and though it may be moveable on inspiration it never is as moveable as the spleen.

Other tumours situated in the left hypochondrium sometimes give rise to difficulty in diagnosis. The following have especially come under my observation.

II Impacted faeces in the Colon.

A lump is felt in the left hypochondrium. The lump is irregular in outline and

never presents the sharp outline of a splenic tumour. This is always preceded by constipation.
The tumour is usually wholly removed by using copious enemata.

III Tumour growing in the upper part of the mesentery.
Such a tumour may be found in the left hypochondrium. The tumour is irregular in shape and is attached deeply behind, it does not move on respiration and the hand can frequently be got above it and thus separate the tumour from the spleen.

Causes of enlargement of the spleen.
The spleen may be enlarged from a large number of causes, the explanation of some being obvious such as congestion - active or passive - or morbid deposits such as albuminoid, syphilitic or malignant disease.

The explanation of others however is very doubtful since the exact part played by the spleen is unknown. In fact though the splenic enlargement may be the outstanding feature of the case it is extremely doubtful that it is a primary splenic affection.

Amongst such diseases may be mentioned. Leucocythemia and the various forms of the so-called splenic anaemias.

Various forms of splenic enlargement may now be enumerated.

I Congestion

(a) Active in various acute infectious diseases i.e. typhoid, septicaemic and pyaemic conditions. Weil's disease Acute tuberculosis etc.

(b) Passive. In portal congestion as in pressure on the portal vein and cirrhosis of the liver and also in

tumours of the portal fissure of the liver. Also in certain chronic cardiac and pulmonary affections.

II Malarial conditions

III Morbid deposits i.e. tubercle, albuminoid disease, syphilitic disease especially congenital syphilis, cancer, hydatid cyst and abscess.

IV Special diseases - Leucocythemia and splenic anaemia.

V Infarcts.

(a) Simple (b) Infective.

Some general remarks on the clinical significance of splenic enlargements.

In some cases the most obvious feature is marked splenic enlargement with or without other symptoms.

In other cases the presence of certain symptoms such as marked anaemia irregular pyrexia (without obvious cause) lead us to examine among other organs the spleen.

In a third series of cases the splenic enlargement is only found either during methodical examination or more or less accidentaly. Its presence may, nevertheless, give us a clue to what otherwise would have been missed and may lead us to examine the blood.

I will now illustrate what I have said by giving a few examples of the clinical significance of splenic enlargement.

I A young man 22 years of age complained of some tenderness and pain in the right iliac bone. This was followed by continued and persistant temperature, loss of strength and emaciation.

The cause of these serious symptoms was for a considerable time in a state of doubt. An examination for evidence of tubercle or typhoid fever.

gave negative results. The spleen became enlarged and the enlargement gradually increasing suggested a pyaemic condition which the post-mortem examination proved to be correct.

II A man 43 years of age complained of weakness, loss of energy and general malaise. He had continued pyrexia but no other symptoms or signs.

The spleen however was somewhat enlarged and examination of the blood at once showed a condition of leucocythemia.

III A child 6 years of age complained of pains in the legs which at first gave rise to a suspicion of rheumatism.

There was irregular pyrexia, gradual wasting and weakness but no other symptom.

On examination the spleen showed slight enlargement; the glands of both axillae were also enlarged and this leading to a blood examination showed the condition to be one of acute Leucocythemia.

IV A woman 43 years of age, with pale sickly complexion complained of profuse haematemesis. There was no pain after food or other gastric disturbance, nor was there any evidence of cirrhosis of the liver.

On examination both the spleen and the liver were decidedly enlarged. Examination of the blood showed no leucocytosis but there was marked diminution of the red blood corpuscles. The patient died suddenly of profuse haematemesis, no post mortem examination could be obtained but there is not much doubt but that

the case was one of splenic anaemia.

V A man 37 years of age was admitted to the Cardiff infirmary with a history of previous Rheumatism and with marked pyrexia.
On examination there was a large tender splenic tumour.
Examination of the heart showed marked mitral stenosis.
The case was diagnosed as malignant endocarditis with infarction of the spleen and the man dying from cerebral embolism the post mortem examination showed the above condition.

These cases illustrate well the clinical significance of enlargement of the spleen in some cases which might otherwise escape diagnosis and therefore how important it is in all doubtful cases to examine the spleen which, we may remember is frequently

in the three diseases which commonly give rise to so much difficulty in diagnosis i.e. Typhoid fever, tubercular disease, and pyaemic infections and in the latter the enlargements may be embolic or non embolic and frequently a combination of both.

After these remarks I will now give in some detail the records of cases which have lately come under my observation to illustrate the chief points referred to.

Cases.

1 Splenic Leucocythemia.

R. G. 43 years old. a warehouseman was admitted to the Cardiff Infirmary complaining of swelling in the stomach and weakness.

History. Patient was quite well until sixteen months before admission, when he commenced to suffer from indigestion accompanied by pain and flatulence and this symptom gradually got worse and troubled him for a period of about six months and was accompanied by pallor and weakness which got progressively worse up to the date of admission. Six months before this date a swelling on the left side of the abdomen was noticed by his doctor.

Four months before admission his feet and ankles became swollen

and he suffered from sharp shooting pain in the left leg. The swelling in the left side of the abdomen has gradually increased in size but has not been painful. The only other symptom which the patient has complained of is frequency of micturation.

State on admission.

Patient is pale and thin and says that he has lost two stones in weight since the beginning of his illness.

His appetite is good but there is some discomfort and flatulence after food.

The tongue is slightly furred. The abdomen is swollen and the cutaneous veins are prominent and there is a distinct enlargement in the left hypochondriac and lumbar regions, in which situation a hard tumour with well defined borders

can be felt — the inner border having a notch at its lower end. There is some slight tenderness over the tumour.

There is dulness on percussion continuous above with the splenic dulness. The tumour which is freely moveable on respiration extends upwards beneath the costal arch and is obviously an enlarged spleen.

The pulse is small & regular.

Other organs are normal.

The urine is dark coloured, acid, Specific Gravity = 1020. and contains a small amount of both blood and albumen.

A deposit from it contains red blood corpuscles and a considerable number of leucocytes with a few crystals of uric acid.

Blood obtained on pricking the finger is turbid, pale and coagulates bodily

Microscopic examination of the blood shows besides the ordinary forms of leucocytes the following

I Large mononuclear cells with fine granules of protoplasm.

II Large and small eosinophile cells.

III Large narrow cells – myelocytes.

The red blood corpuscles form good rouleaux and a few nucleated red cells and also a few deformed red cells are seen.

Result of blood count was as follows.

Red corpuscles. 2.600.000. per CMM.

Leucocytes. 600,000 per CMM.

Progress of the Case.

After admission patient rapidly got weaker and in a month's time several enlarged glands were felt in the axilla and groin and he died six weeks afterwards.

Remarks on the case.

This is a typical case of leucocythemia

of the ordinary splenic type. It had a gradual onset, the first symptoms being of the nature of dyspepsia and giving rise to no suspicion of the serious character of the illness which was not recognised until the spleen formed a very palpable tumour. It is not at all unlikely that if one had been suspicious the splenic enlargement would have been detected much earlier in the course of the disease.

Vague symptoms in connection with the abdomen and of dyspeptic character arising for the first time in a man over 40 years of age and without apparent exciting cause and progressing in spite of treatment should always arouse a serious suspicion and lead one to examine the stomach carefully from the point of view of malignant disease and also to examine the spleen

and further to make an examination of the blood.

There was no pyrexia in the course of this case. This symptom is frequently present in Leucocythemia especially in the acute varieties.

Another point of interest in the case is the enlargement of the glands in the axilla and groin two weeks before his death.

II Ulcerative endocarditis with enlargement of the Spleen.

T. E. age 23, labourer, was admitted to the Cardiff Infirmary for a lump in the stomach region and shortness of breath.

History. Patient was quite well until six months ago when he had a severe attack of Rheumatic fever which kept him in bed for three months.

During the next month patient, though able to get about, felt very weak and suffered from cough and shortness of breath. After that he commenced to have pain after food and vomiting which gradually got worse and continued until admission; eleven days before which date he noticed a lump on the left side of the abdomen which has rapidly increased in size and was painful when touched.

State on admission. Patient is pale, weak

and thin.

He has an irregular pyrexia varying from 96° to 103°.

Circulatory System The apex beat is in the sixth intercostal space 3½ inches outside the nipple line.

The impulse is diffuse and undulating.

There is a Systolic thrill over the aortic area.

Auscultation. Systolic bruit is heard propagated to the axilla.

Over the aorta is heard a harsh, grating Systolic murmur propagated upwards to the vessels of the neck.

Over the pulmonary atery is heard a soft Systolic bruit and the second sound is accentuated.

The abdomen. There is some general destention of the abdomen with marked prominence in the left hypochondriac and lumbar regions where on palpation a firm well-defined tender tumour is

ground. dull on percussion and extends upwards beneath the left. costal arch and is evidently enlarged spleen.
Over its lower part. a friction sound is heard on the patient taking a deep breath.
The spleen reaches beyond the level of the umbilicus.

Progress.

The patient gradually became worse sinking into a typhoid condition and died 14 days after admission.
No post. mortem examination could be obtained.

Remarks. This case is one of interest. as illustrating the effects of embolism; which emboli no doubt were of an infective character.
The markedly remittent temperature, the severity of the general symptoms and the rapid, tender enlargement of the spleen prove this.

although the diagnosis was very obvious the case nevertheless illustrates the importance of examining the Spleen in cases of endo-carditis in which there is pyaemia as the examination of this organ will often clear up the diagnosis not only in cases where the heart valves are the seat of pyaemic infection but where there is pyaemia from other though less apparent sources as in one of the cases mentioned by me already pages. 17 – 18.

III alcoholic cirrhosis of the liver with splenic enlargement in a boy.

D.E. a boy. 9 years of age. Admitted to the Cardiff Infirmary for enlargement of the abdomen.

History. The enlargement commenced two weeks previous to admission and was accompanied by pain which was very severe the night before admission.

Patient has suffered lately from repeated attacks of diarrhoea.

The boy has been very much petted at home and always had half a pint of beer before going to bed beside which he has been given a good deal of spirits and port wine.

From indulgence in these respects the child had become a complete tippler and was always longing for alcoholic drinks which were freely supplied to him.

State on admission

The abdomen is considerably swollen, the girth at the umbilicus being 32½ inches; and the veins of the abdominal wall are very prominent. There is marked fluctuation in the flanks and the enlargement of the spleen can be felt extending nearly to the umbilicus.

The spleen is hard and has a well marked notch on its anterior border.

On percussion there is dulness in the flanks and also dulness over the tumour which is continuous above with the splenic dulness.

The percussion dulness of the liver is not enlarged.

After admission the patient vomited blood several times and there was occasional melaena.

Post mortem examination

There was advanced atrophic cirrhosis

of the liver; the organ being small, hard, and typically hobnailed.
The spleen was enormously enlarged and hard.
The mucous membrane of the stomach was much congested and showed signs of submucous haemorrhages.
The peritoneal cavity contained a large amount of ascitic fluid.

Remarks.

This case is a very interesting one from many points of view.

I As a typical case of cirrhosis in a child in which there was a very definite history of alcoholic excess.

II It is interesting to observe the very great enlargement of the spleen which was much greater than that usually found in cases of cirrhotic liver in adults and probably the youth of the patient accounts for this as the organ at an early age seems to

35

be very distensible.

although in children enlargement of the organ is usually due to congenital syphilis or rickets this case shows that alcoholic cirrhosis is one of the rare causes to be borne in mind especially if there is a distinct history of alcoholism & ascites is present. & if there is no syphilitic taint.

IV Banti's disease

L. R. boy. 12 years of age. Admitted to the Cardiff Infirmary complaining of swelling of the abdomen.

Family history good.

History Patient's previous health had been good until two years ago when it was noticed that the abdomen was somewhat swollen without pain or other disturbance of the general health.

The swelling gradually disappeared though never entirely.

about two months before admission the swelling again came on rather rapidly and became very marked causing discomfort without pain or other symptom.

A few days previous to admission it is stated that the abdomen was tapped and a considerable amount of fluid withdrawn.

State on admission. The boy is bright

Somewhat pale, but not of a sickly appearance.

Digestive System.

The tongue is clean. Appetite poor.
There is no pain in the stomach nor abdomen.
No dyspeptic symptoms nor vomiting.
The bowels are regular.

abdomen. There is enormous general distention of the abdomen more marked on the left side.
The skin of the abdominal wall is tense, shining, and the veins on it are prominent.
The umbilicus is everted and just below it is the mark of the puncture caused by the tapping.

On palpation there is indistinct fluctuation but no tenderness anywhere.
In the left hypochondrium and extending nearly to the Umbilicus is felt a hard superficial tumour going up beneath the left costal arch and freely moveable on respiration. Its surface is smooth & firm.

Its anterior border is sharp and notched. Its lower end is rounded as also is its posterior border and the hand can be got between this border and the Spine. On percussion it is quite dull and the dulness is continuous above with the normal area of ordinary splenic dulness. and there is a resonance posteriorly between it and the vertebral column. The mass felt is evidently an enlarged spleen.

Percussion over the rest of the abdomen is tympanitic except for marked dulness in both flanks altering with change of posture.

The liver is not felt and its percussion dulness is normal.

Respiratory System: There is neither pain, cough, nor dyspnoea.

At the left base behind there is dulness with some bronchial breathing and well marked crepitations.

Circulatory System. Pulse 100 and regular.

Heart. presents no abnormalities on examination nor are there any haemic murmurs.

Examination of the blood.

Red corpuscles. 4.194.000. per CMM.

Leucocytes 2.980 per CMM.

Stained films show very little change in the red corpuscles - a few only being altered in shape.

The white corpuscles are unaltered and there are no abnormal varieties.

Second examination

Red corpuscles 2.500.000 per CMM.

Leucocytes 2.100 per CMM.

Haemoglobin 40%.

Stained films show no change either in the red or white corpuscles.

Progress of the case.

The boy was put on arsenic and his abdomen was drained four months ago. I enclose a photograph which shows

the condition of the spleen at the present time.

Since he has been under treatment the ascitic fluid has not reaccumulated though the spleen has gradually enlarged. The boy's health remains good and he suffers from no discomfort except the inconvenience of a much enlarged abdomen.

Remarks.

This case is a very interesting one. At first sight because of the greatly enlarged spleen the case was thought to be one of Leucocythemia complicated by ascites. And an examination of the blood was consequently made which showed that there was an actual diminution of leucocytes which at once excluded that diagnosis. The first examination of the blood showed only a very slight diminution in the number of red corpuscles.

The second examination showed considerable diminution.
There were no alterations in the shape of the red blood corpuscles and only slight diminution in the amount of haemoglobin present.
The question then became what was the nature of the disease?
After considering every possibility the diagnosis arrived at was that it was a case of so-called Banti's disease - a disease characterised by enlargement of the spleen, the presence of ascites, and no special blood change except a slight degree of anaemia.
Some might class it as a case of splenic anaemia or at least as one of the varieties of that affection.
The term splenic anaemia however is a very vague and indefinite one and is more properly confined to a rare disease with definite clinical phenomena including

pain in the splenic region and certain blood changes.

In the Lancet of August 1902 some cases were described by Dr. Barr of Liverpool under the title of Banti's disease and to these that described above has certainly a close resemblance.

It is interesting to notice that the ascites though so marked has not recurred showing that it is evidently not due to pressure on the portal vein. As to the pathology of Banti's disease the affection has been supposed to be due to some lesion of the splanchnic nerve and not to be a primary splenic disease and its effects on the blood, if any, are probably purely secondary.

V Splenic Anaemia.

J. L. Single woman, 22 years of age. was admitted to the Cardiff infirmary complaining of repeated attacks of haematemesis.

History Since childhood patient has been subject to epistaxis but she was otherwise healthy until five years ago when she states she had her left side moving a heavy piece of furniture and for a year after this she suffered from occasional coldness and numbness on that side.

During the last four years patient has been gradually loosing strength and has had several severe attacks of pain in the left side of abdomen over the splenic region and her menstruation has been very irregular.

During this time patient has also suffered occasionally from hysterical fits and palpitation of the heart on the slightest

excision.

On the 5th of Dec: last she had a very severe attack of haematemesis and during the next three days she vomited blood on nine occasions.

Two years ago patient noticed a swelling in the abdomen under the left ribs which has been gradually increasing in size.

Condition on admission.

Patient fairly well nourished though very anaemic.

The skin is pale with a slight yellowish tint and the conjunctivae and gums are very anaemic.

There is a small subconjunctival haemorrhage of the right eye.

Temperature varies between 99° in the morning and 100° in the evening.

Digestive System: appetite is very poor and she complains of much thirst.

She complains of pain and uneasiness in

the stomach region at times. which sensations are not related to the taking of food.
The bowels are regular.

abdomen

On inspection the abdomen is seen to be unduly prominent in the left hypochondriac region.
On palpation the spleen is felt to be very much enlarged. reaching downward and inward two inches below the umbilicus. It is hard and firm to the touch and tender on pressure and a notch can be felt on its anterior border and the organ moves slightly on respiration.
It is dull on percussion, the dulness extending upwards under the left costal arch where it is continuous with the ordinary splenic dulness in that region.
The liver can be felt about a finger's breadth.

below the right costal arch.

The lungs are healthy.

The heart is healthy but there are well marked haemic murmurs over the apex and pulmonary areas and there is a well marked "bruit de diable" in the veins of the neck.

Blood.

Red corpuscles 1.168.000 per C.M.M.

Haemoglobin 15%.

There is slight poikilocytosis.

Leucocytes 5000 per C.M.M.

There are no alterations in the form of the leucocytes and no myelocytes are present.

Remarks.

This is without doubt a case of splenic anaemia.

The history of the case is of interest. From the fact of the patient having had a strain on the left side from which time onwards she has never felt

and has complained of peculiar sensations over the Splenic region. followed later by distinct history of pain and tenderness.

The symptoms which alarmed her and caused her to seek medical aid was the occurrence of severe haematemesis. independent of any other gastric symptoms. Her doctor having examined her abdomen and discovered an enlarged Spleen supposed that it was a case of Splenic leucocythemia.

However, the history of haematemesis, the marked anaemia, and the pain and tenderness over the Splenic region being unusual in ordinary cases of Leucocythemia suggested the affection was probably of a different nature and the examination of the blood showed that it really was so, as there was an actual decrease in the number of leucocyte together with

marked alterations in the number of red corpuscles and the quantity of haemoglobin - the red corpuscles being about one quarter of the normal though the haemo-globin was just about one sixth of the normal thus showing that there was not only a great diminution of these corpuscles but a still greater diminution in the amount of the haemo-globin.

This case serves to show that Leucocythemia, without examination of the blood, cannot certainly be diagnosed and as the name leucocythemia means leucocytic blood it is only by an excess of leucocytes and in some cases by the presence of myelocytes that the presence of this disease can be definitely proved.

VI Acute Leucocythemia

S. W. aged 17, a boy, complained of slight headache, weakness, and loss of appetite.

Previous health had been good except for a fractured thigh six months ago from the effects of which he has entirely recovered and was at his work up to within a week of being seen.

On examination it was found that the patient was in a weak state and of a pale sickly appearance.

Pulse 84.

Respiration 24.

Temperature 102°.

Careful examination having failed to show any physical signs the blood was tested ten days after the commencement of the illness and no Widal's reaction was obtained.

After being under observation for six days during which time the temperature

varied between 100° & 103° and patient had had continuous priapism it was noticed that the spleen was enlarged and hard but not tender and there were a few haemorrhagic spots on both flanks.
There was no abdominal distension or tenderness.
The tongue was clean & there was an absence of gastric or intestinal disturbances.
A specimen of the blood was taken and submitted to a careful examination with the following result.
Red corpuscles 1.620.000 per C.M.M.
White corpuscles 930.000 per C.M.M.
Examination of the white corpuscles showed that the increase was due to excess of lymphocytes.
The patient became weaker and slight but distinct enlargement of the glands in both axillae and both groins was

fell.

He sank rapidly and died within three weeks of the onset of the illness and during the whole of the two weeks while he was under observation there was continuous and marked priapism.

Remarks. This case is one of great interest as an example of acute Leucocythemia, and the following points are worthy of being mentioned.

1. Duration of the illness.

The entire illness only lasted three weeks or at least there were only symptoms present for that time. Previous to three weeks before his death the boy felt perfectly well. He was not pale and was at his work and it was only with difficulty that his mother forced him to stay at home and take to send for the doctor.

II The insidious onset of the affection with headache, malaise, and continued fever suggested the probability of enteric fever and the possibility of tuberculosis. The blood was tested for enteric fever days after the onset of the illness, but no Widal's reaction was obtained and indeed there were no other symptoms suspicious of typhoid, such as abdominal distension or tenderness or spots. and the course of the pyrexia was of an irregular type.
A careful enquiry into the family history and the boy's past health and a thorough examination failed to disclose any evidence of tubercular disease.

III Enlargement of the Spleen.
This was noticed after the patient had been under observation for six days and the organ was very firm but neither painful nor tender.
This sign together with the pallor and

the haemorrhagic spots noticed in the flanks suggested some diseased blood condition and led to the examination of the blood with the result above mentioned.

IV Examination of the blood.

This showed conclusively that the case was one of leucocythemia.
There was marked diminution of the red corpuscles and an enormous increase of the white.
An examination of stained films showed that the great excess of leucocytes consisted of small white corpuscle or lymphocytes - thus showing the case to be one of acute lymphatic leucocythemia and this conclusion was borne out by the enlargement of the axillary and inguinal glands which quickly made its appearance.

V It is most interesting to notice that during the whole of this time this patient was under observation there

was marked and continuous priapism and the penis was in contact with the abdominal wall the whole of the time and during the last week of his illness the patient complained much of the distress which this symptom occasioned.

In this connection Osler in his Textbook of Medicine has drawn attention to the not infrequent occurence of priapism as a marked symptom in cases of leucocythemia.

In conclusion I may say that the examination of the Spleen and as a result that of the blood led to the correct diagnosis of what was indeed a most obscure case.

VI Splenic Anaemia.

C. S. a collier. 43 years of age, complained of weakness, loss of flesh, and shortness of breath.

He had enjoyed excellent health until twelve months ago.

There was no history or sign pointing to malarial affection.

Twelve months ago he met with a severe accident while at his work - a cage slipping and hitting and severely bruising him on the left side breaking the left thigh bone.

The fracture united readily but the patient remained pale and weak and six months after the accident it was noticed that the Spleen was considerably enlarged reaching beyond the level of the umbilicus.

It was hard and not tender.

An examination of the blood gave the following result:-

56

Red corpuscles - 2.250.000. per C.M.M.
White corpuscles 8.300. per C.M.M.
There were no abnormal varieties of leucocytes present and there were no other physical signs.

Remarks

Nature of the case. The anaemia with enlargement of the spleen suggested that the case was probably one of leucocythemia.
The examination of the blood however though showing well marked diminution in the red corpuscles showed but very little increase in the number of the leucocytes and indeed even this small increase was probably only physiological and due to the subfebrile pyrexia from which he suffered.
The case could only be regarded as one of the varieties of splenic anaemia speaking in the broad sense of the word. and it is probable that the

affection is due to the accident.
It is interesting to note that during the time the spleen has been under observation it has markedly diminished in size.
In regard to the question of traumatism as a cause of splenic enlargement. it is of interest to notice that some cases of leucocythemia have been attributed to that cause and that the cases of so-called Banti's disease- a variety of splenic anaemia - have followed a blow over the splenic region and such cases are recorded by Dr. Barr of Liverpool in the Lancet of August 1902.

VII Malarial Fever.

E. S. 16 years of age. A groom. admitted complaining of weakness and sweating at nights.

Family history good.

History of present Illness.

Patient has just recently returned from Beira, South Africa, and was quite well until twelve months before admission when his appetite began to fail.

He suffered from great thirst and his legs became swollen and he placed himself under medical treatment without deriving any benefit as he was treated for "dyspepsia".

A month afterwards he was admitted into the Durban hospital and was told that he was suffering from Malaria. for which he was treated and improved greatly during the three weeks that he was an inpatient.

He arrived in England about a month ago

in a weak state.

State on admission

The patient is a fairly well nourished man but says that he has lost a good deal of flesh during his illness.

Alimentary System.

There are no symptoms of gastric or intestinal disturbance.

The abdomen is not distended though somewhat tense.

The spleen is felt extending one inch below the left costal margin and its dulness extends upwards to the level of the seventh intercostal space.

The liver is also palpable. its lower border reaching to about an inch below the right costal margin

Lungs & heart healthy.

Progress of the case.

Every other evening patient felt hot. for a short time. then perspired freely and afterwards felt rather cold and

the temperature at no time was above 100° and during the whole of the time he was in hospital he was treated with quinine and later by arsenic and iron and after the first week the evening attacks became very slight.

During the second week there was only slight sweating at night then he became practically well after three weeks of treatment when he was discharged.

Remarks.

This was undoubtedly a case of malarial fever. The attacks were of a tertian character and were very ill marked and he at no time suffered from rigors. It will also be noticed that the hot stage ceased first and at the end of the attack there was an indefinite cold stage.

The temperature at no time was above

61

100° and the affection was readily cured by quinine.

The enlargement of the spleen and liver and the patient's residence in South Africa pointed to the nature of the affection, although the malarial parasite was not discovered in the blood — this probably being due to the patient being all over pale on quinine.

General remarks on the pathology of splenic affections.

To discuss the pathology of splenic affections is a very difficult matter as our knowledge of the functions of this organ is so very meagre. We know, of course, that the spleen is one of the ductless glands as the thyroid and suprarenals. Whether the spleen is a secretory gland is unknown but its structure from the absence of epithelial tubes would not lead us to believe so. Its function whatever that may be is not such an important one that it cannot be compensated for as has already been mentioned. It is generally believed that the spleen has some direct function in relation to the blood either influencing the formation of corpuscles or else their destruction.

The evidences however of physiology are very indefinite and really give us little clue in understanding the function of this mysterious organ. We now wish to examine if the evidence of pathology throws any light on this obscure question. In the first place we know nothing of atrophy of this organ in any way comparable to that of atrophy of the thyroid or even of the supra-renal capsules and consequently we know of no symptom caused by loss of function of this organ from disease.

Cases, however, are described in which from the presence of disease in the spleen its function must have been in abeyance but there have been no particular symptoms depending on it and in such cases it is not improbable that its loss of activity

has been compensated for elsewhere.
The chief pathological affections of the Spleen are those which result in enlargement of that organ and such diseases as mechanical enlargement from portal congestion, albuminoid disease, new growth etc give rise to no Symptoms apart from general ones.
The two classes of enlargement which are most interesting from a pathological point of view are.

I Those of infectious disease generally

II Those occuring in certain blood diseases — leucocythemia, lymphadenoma, and Splenic anaemia.

The enlargement of the organ occuring in certain infectious diseases seem to show that the Spleen may probably have some function connected with the destruction of micro-organisms and their great abundance in this organ

certainly supports such an idea.
The relations, however, of the spleen to bacterial infection are as yet imperfectly worked out and form a promising field for future investigators.
The next point we have to consider is what suggestions arise in association with splenic enlargement in certain blood diseases.
In Leucocythemia it is well known that the splenic enlargement is an almost constant symptom so much so that when the spleen is enlarged an examination of the blood is frequently of the greatest importance. It is well known, however, that there is no relation between the size of the spleen and the leucocythemic change in the blood for some of the gravest cases occur in which the spleen is but little enlarged.

This and other facts show us that the splenic enlargement is only a symptom and not a cause of the leucocythemia and the same may be said in the case of Lymphadenoma. After excluding cases of enlargement of the spleen due to causes before mentioned there remains a residuum of cases in which the only prominent symptoms are enlargement of the spleen associated with anaemia. Among such cases are serious ones and also mild forms and they have been classified under the head of splenic anaemia.

<u>The question will now discuss is what is splenic anaemia?</u>.

By splenic anaemia is usually meant a progressive anaemia accompanied by enlargement of the spleen and in which an examination of the

blood shows no increase of white corpuscles, but more or less diminution of the red corpuscles. Before arriving at a diagnosis of splenic anaemia in the presence of enlarged spleen accompanied by anaemia it is necessary to exclude other causes of this combination of symptoms eg. malaria and Syphilis. After such exclusion we have left a considerable number of cases (not uncommonly in the absence of blood examination diagnosed as leuco-cythemia) to which the name of splenic anaemia has been applied.

Such cases differ much in their clinical course and may for convenience be classified as follows.

I Splenic anaemia in children.

II Banti's disease.

III Splenic anaemia in adults.

(a) Mild cases (b) Severe cases

of these groups of cases some limit the term splenic anaemia to a comparatively small number of cases seen in adults with severe symptoms and in which enlargement of the spleen is accompanied by marked tenderness.

Such cases, however, are extremely rare and the limitation of the term to this variety of cases is far too exclusive and leaves unclassified a large number of cases which come under observation. And indeed there is no definite dividing line between the different varieties of splenic anaemia.

In the case of children an enlargement of the spleen with anaemia and marked diminution in the number of the red corpuscles is comparatively common and many of these cases have been ascribed to Syphilis

nickel and other causes, but nevertheless, no cause can be fairly assigned to a large number of such cases and in the present stage of our knowledge they can only be called "ideopathic".

The second group of cases to which I have referred – "Banti's disease" and of which I have recorded an interesting example, are characterized by ascites in addition to the other two cardinal symptoms.

The exact relationship of "Banti's disease" to "Splenic anaemia" of adults is still disputed. Most authorities consider that "Splenic anaemia is simply an early phase of Banti's disease, but if this was the case we should expect the blood change to be much more marked in "Banti's disease" than in "Splenic anaemia".

In the pathology of "Splenic anaemia"

a question naturally presents itself whether the splenic changes are primary and the cause of the anaemia or whether they are secondary.
Those who hold that the splenic changes are primary suppose that the symptoms are due to the loss of the functional activity of that organ but this view can not be held in the presence of the well known result of splenectomy.
Some hold that the disease may be due to some morbid process originating in the spleen and thus would explain the decided improvement which has taken place in some cases where the spleen was removed.
Others again hold that splenic anaemia is a result of an exaggerated activity of the haemolytic function of the spleen but there is nothing to support this view

71/5

It is on the whole probable that the enlargement of the spleen is a symptom of the disease.

Owen John Evans.