FAMILIAL SPLENIC ANÆMIA

BY

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The three cases, the notes of which are given in full, are of particular interest in that they are in members of one family.

Case reports.

Case 1.—Robert D., aged 14 years, was admitted to hospital in June, 1925. Nine months previously he had several attacks of hæmatemesis. A good recovery was made and he was apparently in good health until a few days before admission, when he complained of pain in the abdomen. Splenic enlargement was discovered, and he was admitted to hospital for investigation and treatment.

The boy was well developed for his age; there was slight pallor of the mucous membranes, and the lower border of the spleen was felt three inches below the costal margin.

TABLE 1.
BLOOD IN CASE 1.

Blood examination :—	per c.cm.	per cent.
Red cells	4,100,000	
Hæmoglobin	70	
White cells	1,800	
Polymorphonuclears	540	30
Lymphocytes	1,116	62
Eosinophils	108	6
Transitionals and mononuclears	36	2

Fourteen days after admission splenectomy was done by Mr. E. H. B. Milsom.

At operation it was noted that there was slight enlargement of the liver, but there was no evidence of cirrhosis. The spleen was considerably enlarged, weighing 25 oz., and showed perisplenitis. It had a purplish colour and was doughy to palpation. The splenic vein was not thrombosed. Microscopic examination showed a generalized fibrosis, less in degree than in the subsequent cases. There was marked endothelial proliferation in the Malpighian bodies. No eosinophils were seen.

Recovery from the operation was uneventful, and the boy was discharged from hospital in 21 days.

Six months later he had a further hæmatemesis, and on admission it was found that the liver was enlarged and there was well marked ascites. His red cells numbered only 1,840,000 per c.mm. Under treatment the ascites cleared and the blood picture improved.

After 13 months, during which time he was working, he had a further hæmatemesis, came into hospital, developed a mesenteric thrombosis and died.

POST-MORTEM EXAMINATION.—There was deep jaundice. There was thrombosis of mesenteric veins, with gangrene of the greater part of the ileum and generalized peritonitis.

The liver was enlarged and smooth and weighed $3\frac{1}{2}$ lb. There was no cirrhosis. The portal vein was thrombosed. The stomach showed multiple small erosions throughout the mucous membrane. There was no varicosity of the œsophageal veins. A small accessory spleen was found to show the same changes as the spleen.

Case 2.—Edith D., aged $15\frac{1}{2}$ years, admitted December, 1928, had been in good health until the previous day, when she had complained of abdominal pain. During the night she had vomited blood on several occasions.

On examination there was marked pallor of skin and mucous membrane. The spleen was palpable about two inches below the costal margin. There was no ascites.

TABLE 2.
BLOOD IN CASE 2.

	per c.mm.	per cent.
Red cells	3,020,000	
Hæmoglobin		55
White cells	3,630	
Polymorphonuclears	2,540	70
Lymphocytes	982	27
Transitionals	108	3
Fragility of red cells		normal.
Wassermann reaction		negative.
Bleeding time... ..		4 minutes.
Coagulation time		5 „
Blood group		Type III.

Splenectomy was performed by Mr. Kenneth Mackenzie on January 24th, 1929, and the girl was discharged well four weeks later. At operation the liver was not enlarged; its surface was smooth; it appeared normal. The spleen weighed 22 oz., showed perisplenitis and generalized fibrosis. Microscopically the Malpighian bodies were much diminished in number: those remaining were much encroached on by fibrous tissue. Eosinophils were abundant. In parts there was great dilatation of sinuses which were filled with blood.

During the next six months, the patient had two attacks of melæna, which were controlled by intramuscular injections of whole blood. After an operation for removal of septic tonsils, at which there was no undue bleeding, she remained in perfect health for 14 months. She appeared a particularly robust and well developed girl. Menstruation was regular and never excessive.

On October 21st, 1930, her blood count showed:—

Red cells	5,500,000 per c.mm.
Hæmoglobin	90 per cent.
Platelets	495,000 per c.mm.

One month later, she complained of faintness, passed black stools, and vomited bright blood several times. In spite of repeated transfusion, she died within 36 hours from the onset of symptoms. The blood platelets at this time numbered 240,000 per c.mm.

POST-MORTEM EXAMINATION.—The œsophagus contained blood. The veins at the lower end of the œsophagus, and the adjacent part of the stomach were varicose, but their walls appeared to be intact.

The stomach contained a large quantity of blood. The mucous membrane appeared quite healthy, and there was no evidence as to the source of the hæmorrhage. The intestines contained much blood. There was marked hæmolytic staining of the mucosa of the distal part

of the small intestine and in the proximal half of the colon. There was no thrombosis of mesenteric vessels. Several mesenteric glands were enlarged and caseating. The liver was of normal size, but very pale. There was no thrombosis of the portal vein, and no cirrhosis. There were no spleniculi, and the other organs were essentially normal.

Case 3.—Ronald D., aged 11½ years, was admitted to hospital on August 9th, 1929. The boy's health had been good until the night before admission, when he vomited blood several times.

On examination there was marked pallor and slight fever (100·6°). The tonsils were enlarged and septic, though not acutely inflamed. The liver and spleen were not palpable, and there was no demonstrable ascites. Red blood cells numbered 2,440,000 per c.mm., and there was 40 per cent. of hæmoglobin. Three days later, the spleen was just palpable below the costal margin, and there were definite signs of ascites. One week after admission, although there was no further hæmorrhage, anæmia was increasing. The spleen now was found to extend two inches below the costal margin, and there was more fluid in the abdomen.

The condition of the blood on August 16th is shown in Table 3.

TABLE 3.

BLOOD IN CASE 3.

						per c.mm.	per cent.
Red cells ...	...	...	...	...	...	1,912,000	
Hæmoglobin ...	...	...	...	...	...		30
White cells ...	...	...	...	...	...	2,200	
Polymorphonuclears ...	...	...	...	...	...	1,300	59
Lymphocytes ...	...	...	...	...	...	792	36
Transitionals ...	...	...	...	...	...	88	4
Eosinophils ...	...	...	...	...	...	22	1
Platelets ...	...	...	...	...	...	104,000	
Wassermann reaction ...	...	...	...	...	...	...	negative.
Fragility of blood cells ...	...	...	...	...	...	...	normal.
Blood group ...	...	...	...	...	...	...	Type III.

Under treatment, the blood picture improved, and the fluid was absorbed from the abdomen. The spleen gradually increased in size, and anæmia persisted. On June 12th, 1930, he had slight melæna, and it was decided to remove the spleen.

This was done by Mr. Kenneth Mackenzie a few days later. The spleen weighed 15 oz. Perisplenitis was present. On section the spleen was of uniform brownish colour, and doughy to feel. Microscopically there was a general fibrosis of the whole organ, with disappearance of normal spleen pulp and of many Malpighian bodies. Eosinophils were numerous.

Six months after the operation, the boy was in much better health and growing rapidly. His red blood cells were 4,000,000 per c.mm., hæmoglobin 80 per cent., and platelets 304,000 per c.mm. Tonsillectomy was performed and some septic teeth removed without undue bleeding.

He remained in good health until February, 1931, when bleeding recurred, and while in hospital mesenteric thrombosis brought about his death. While active hæmorrhage was taking place his platelets numbered 260,000 per c.mm.

POST-MORTEM EXAMINATION.—There was a mesenteric thrombosis with gangrene of six feet of ileum. There was a large quantity of blood in the small intestine. The splenic vein was thrombosed. The stomach contained no blood. There were small erosions in the mucosa. The vessels of the œsophagus showed no varicosity. The liver was very fatty. There was no cirrhosis, and the portal vein was not thrombosed. No spleniculi were found.

Other members of the family.—The mother of the children was a particularly healthy woman, and her family history and that of the father were quite negative.

The mother's blood reacted negatively to the Wassermann test. The other members of the family, a girl Edna, aged 20, and James, aged 13, were examined, and no splenic enlargement was found. There was no history of hæmorrhage in either case.

Blood examination of the two unaffected children showed :—

	Edna.	James.
Red cells	4,200,000 per c.mm.	5,040,000 per c.mm.
Hæmoglobin	80 per cent.	90 per cent.
White cells	10,420 per c.mm.	7,000 per c.mm.
Polymorphonuclears	49 per cent.	44 per cent.
Lymphocytes	42	49
Transitionals	7	4
Eosinophils	2	3
Platelets	147,000 per c.mm.	166,000 per c.mm.

Discussion.

Osler¹ defined splenic anæmia as 'a chronic affection characterized by progressive enlargement of the spleen, which cannot be correlated with any known cause as malaria, leukæmia, syphilis, cirrhosis of the liver, etc. ; a marked tendency to hæmorrhage, and in many cases a terminal stage with cirrhosis of the liver, jaundice and ascites.'

This definition is a wide clinical one, and includes conditions of totally different pathology. Banti's disease is now known to be a separate entity, as is the syndrome described by Wallgren, thrombosis of the splenic vein.

In spite of advances made in clinical and pathological knowledge, the term 'splenic anæmia' as generally used, still includes conditions differing in their clinical manifestations, and probably in their pathogenesis. Tidy² in discussing the hæmorrhagic diathesis, has stressed the difficulty of separating some cases of splenic anæmia from the hæmorrhagic diathesis. The cases described fall into this category. A thorough search of the literature available has failed to discover any record of cases of splenic anæmia, or of any similar clinical syndrome occurring in members of one family.

Apart from the question of diagnosis, there are many interesting features in these cases. The hæmorrhagic state was intermittent. In between attacks, the children were in good health, and there was no tendency to hæmorrhage, for instance, after tonsillectomy or tooth extraction. Blood platelets were normal in number, even during a period of active bleeding. Splenic enlargement did not precede, but was subsequent to the first hæmorrhage. Splenectomy had no effect in preventing the onset of the hæmorrhagic state.

In the case of Ronald (Case 3), recovery after the first severe hæmorrhage appeared to be slow in comparison with the other two who had the spleen removed. However, when his splenectomy was done later, his blood condition improved.

In no instance did the operation of splenectomy appear to make any difference to the ultimate result, the period between the onset of the disease and death being about two years in each case.

TABLE 4

BLOOD EXAMINATIONS BEFORE AND AFTER SPLENECTOMY.

Case No.	Date	Red cells	Hb %	Leuco-cytes	Poly-morphs %	Lympho-cytes %	Transi-tional %	Baso-phils %	Eosino-phils %	Platelets	Remarks
1	15: 6: 25	4,100,000	70	1,800	30	62	0	2	6	—	—
	2: 7: 25										Splenectomy
	8: 7: 25	5,000,000	70	14,000	65.5	25	7	.5	2	—	—
	24: 7: 25	4,850,000	75	10,200	27.5	51.5	11	4.25	5.75	—	—
	7: 8: 25	5,440,000	75	12,400	24	55.25	9	3.75	8	—	—
	17: 2: 26	1,840,000	40	8,800	20	70	8	0	2	—	Bleeding
	13: 4: 27	2,480,000	40	15,000	77.5	20	2.5	0	0	—	Bleeding
	19: 4: 27	2,208,000	40	16,600	48	42	3.5	1.5	5	—	—
	27: 4: 27	2,400,000	40	14,800	67	25	4.5	2	1.5	—	—
2	31: 12: 28	3,020,000	55	3,630	70	27	3	0	0	—	—
	22: 1: 29	4,870,000	70	2,400	67	26	3	.5	3.5	—	—
	24: 1: 29										Splenectomy
	28: 1: 29	3,300,000	65	22,000	75	21	3	0	1	—	—
	5: 2: 29	4,900,000	70	13,200	64	27	2	1	6	—	—
	12: 2: 29	4,930,000	70	11,200	49	37.5	2	.5	11	—	—
	23: 5: 29	2,900,000	50	11,400	37	48	2	1	12	—	Bleeding
	13: 6: 29	4,900,000	70	7,000	37	46	10	0	7	—	—
	21: 10: 29	5,500,000	90	8,800	33	58	3	1	5	495,000	—
	19: 11: 29	2,368,000		15,000						240,000	—
3	9: 8: 29	2,440,000	40	11,500	69.5	25.5	4.5	.5	0	—	—
	16: 8: 29	1,912,000	30	2,200	59.5	36	4	0	.5	—	—
	26: 8: 29	2,248,000	35	3,400	64	32	2	0	2	—	—
	30: 8: 29	2,600,000	40	3,300						104,000	—
	26: 9: 29	3,712,000	50	2,000	40	60				—	—
	19: 6: 30	5,000,000	75	4,800	43	48	4	0	5	—	—
	25: 6: 30										Splenectomy
	6: 7: 30	4,500,000	75	14,400	61	25	5	.5	8.5	1,000,000	—
	27: 7: 30	4,800,000	70	16,000	64	29	5	0	2	600,000	—
	21: 10: 30	4,000,000	80	14,400	34	52	6	0	8	304,000	—
	13: 2: 31	3,936,000	55	14,400	68	29	3	0	0	260,000	Bleeding

It is obvious that the pathological process must have been the same in each case, and it is difficult to understand why two of the patients should develop mesenteric thrombosis, whilst the third should die from hæmorrhage, apparently due to increased capillary permeability—seemingly diametrically opposed conditions.

The series of blood counts given in Table 4 are of interest, as showing the changes that occurred in the blood picture following splenectomy.

As shown in the accompanying table the alterations in the blood picture after splenectomy are :—

1. Well-marked and maintained increase of leucocytes.
2. Sudden rise of platelet count, followed by gradual fall to normal limits.
3. Slight increase in eosinophil cells.

Summary.

Three cases of splenomegaly associated with the hæmorrhagic diathesis are described in a sister and two brothers.

The term 'splenic anæmia' is tentatively applied to the condition.

Splenectomy was done in all three cases, and appeared not to affect the course of the disease.

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REFERENCES.

1. Osler, W., *Am. J. Med. Sc.*, Chicago, 1900, LIV, 119.
2. Tidy, H. L., *Brit. Med. J.*, London, 1930, ii, 1073.