Efforts to contact the patient for further investigations after her discharge from hospital have not been successful. Unfortunately, the culture materials, together with the organisms, were discarded after identification as a matter of routine before the scope of further investigations related to the problem could be realized.

Discussion

The reactions leave little doubt that the patient was group O, Rh+, presenting the phenomenon of polyagglutination, contamination being ruled out as the tests were made on fresh samples. Autoagglutination must have been partly due to the non-specific cold agglutinin, but mainly due to the "T" antigen-antibody reaction, as it persisted even after prolonged adsorption at low temperature with group O cells. It is not yet clear if any significance in relation to polyagglutinability can be attached to the presence of the specific haemolysins anti-A and anti-B, apparently in high titres.

Like most of the recorded cases, this case presented bacterial infection with features of septicaemia. In none of the reported cases, however, could the infecting organisms be isolated from blood culture (Reepmaker, 1952). That bacteraemia could have been present in those cases also at some stage of the infection could not be ruled out, for blood culture is likely to be negative much before the organisms are eliminated from the local sites, and blood of a patient presenting polyagglutination will continue to show the phenomenon for some time after the control of the infection, until substantial numbers of the changed erythrocytes have been replaced by new ones.

What part bacteraemia plays in the *in vivo* process can as yet be only a matter of conjecture. However, it indicates, at least, bacterial growth severe enough to produce conditions approaching that *in vitro* for the enzymes to affect the erythrocytes. Presence or absence of associated bacteraemia may perhaps be one of the explanations for polyagglutinability not appearing in bacterial infections with the regularity with which red cells undergo transformation *in vitro*. A direct proof has to be sought, and attempts must be made to test the ability of the organisms isolated from blood culture or local sites to produce the change *in vitro* as well. Meanwhile, there does not appear to be much objection to regarding bacteraemia in the present case as strong evidence in favour of the common aetiology of the *in vitro* and *in vivo* phenomena.

Summary

A case of polyagglutinability of erythrocytes in a patient with septic abortion and severe *E. coli* infection and positive blood culture is described.

Its similarity to the Hübener - Thomsen - Friedenreich phenomenon is discussed, and that bacteraemia in such cases could be strong evidence in favour of the common aetiology of the two phenomena is stressed.

I am indebted to Dr. B. P. Mishra, lecturer in bacteriology, Darbhanga Medical College, for the bacteriological report. It is hoped that with his collaboration more detailed investigations will be possible in future. Thanks are also due to Dr. Hari Prasad and Dr. M. Quadros, and Dr. S. M. Hashim, superintendent of the hospital, for permission to publish the case.

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Medical Memoranda

Aortography as an Aid to the Investigation of Haematuria

Generally, in the diagnosis of disease, radiology labours under the great disadvantage that a diagnosis can be made only when the disease has caused positive structural changes in an organ or in a system of organs. There is therefore a lapse of time between the onset of symptoms, which may sometimes be alarming, and the confirmation of the diagnosis by x-ray examination. The names of many diseases could be mentioned in which this time-lag occurs, the period showing a good deal of variation in time, largely depending on the severity of the disease; for example, bony metastases cause pain for some time before they become visible radiologically.

It is therefore necessary to use every available method of examination in the elucidation of symptoms in a difficult case. In the following case the patient was suffering from haematuria and the diagnosis was firmly established only by the use of percutaneous abdominal aortography.

VALUE OF AORTOGRAPHY

Most writers would argue that abdominal aortography is of considerable value in demonstrating the degree of obstruction in patients suffering from aortic and iliac atheroma, and also in showing the size and position of an aortic aneurysm.

Agreement concerning its value in the investigation of renal disease is not so unanimous. In the first place, conventional methods are often sufficient to establish the diagnosis, without resort to aortography. Secondly, if conventional methods show an abnormality the surgeon might well decide that he must operate on the kidney, in which case aortography (which is not without its risks) would seem to be unnecessary.

We have found renal aortography to be of value in a number of instances. (1) In proving the presence of a hypernephroma otherwise unsuspected. One of us (J. A. R.) was able to show a hypernephroma in the right half of a horseshoe kidney which was not shown by conventional methods. The case described below is a similar instance of its value. (2) It has been suggested that one type of unilateral disease with hypertension, suitable for treatment by nephrectomy, has the following features (Arthur Jacobs, 1958, personal communication): (a) non-function of one kidney on intravenous

pyelography, (b) the non-functioning kidney reveals a normal appearance on retrograde pyelography, (c) a block in the renal artery is demonstrated by aortography. Also Hodson (1957) suggested that an asymmetry of caliceal pattern may result from arterial lesions. Meaney *et al.* (1958) have shown that there is an absence of filling or diminution of interlobular arteries. (3) Aortography, by showing the pattern of the renal vessels, may be useful to the surgeon prior to performing a partial nephrectomy. (4) Aortography will confirm the presence of renal hypoplasia by demonstrating the poor arterial supply (Barr Stirling, 1957).

A patient recently operated on by one of us (J. C. R.) was found to have only a rudimentary right kidney. The diagnosis was suggested by the aortogram, which showed complete absence of a right renal artery. There is therefore no doubt that renal aortography has an established place in diagnosis. Some claim that it is possible to distinguish between renal cyst and hypernephroma by means of aortography. This is often true, but there is always the doubtful case, so that abdominal aortography cannot always be the final arbiter in the distinction between cyst and tumour.

CASE REPORT

The patient, a man aged 36, was admitted to hospital on June 2, 1958, complaining of haematuria and of severe pain in the right loin, radiating to the groin. Suprapubic pain and relative frequency were also present. On examination there was marked tenderness in the right loin and flank. Cystoscopy revealed a blood-stained efflux from the right ureter, but a right retrograde pyelogram was normal. An intravenous pyelogram also showed normal appearances, so it was thought that the haematuria was possibly due to a small papilloma in the renal pelvis. He was discharged pending more definite evidence pointing to the necessity of exploring the right kidney. On October 3 he was again admitted with the same symptoms of pain and haematuria, which were not so severe on this occasion. Once again intravenous pyelography and a right retrograde pyelogram revealed a normal appearance. Aortography was performed because the previous conventional methods had not yielded any information. The films (Figs. 1 and 2) showed that there was a small

FIG. 3. — Specimen removed at operation.

oval swelling of the kidney, below the pelvis, and at a later phase that there was some "blushing" in the renal substance. A diagnosis of hypernephroma was suggested.

A relatively small hypernephroma was found at the site of the swelling, extending into the kidney. Fig. 3 shows the photograph of the kidney, removed at operation.

CONCLUSION

We believe that, when elderly patients are suffering from haematuria for which an explanation cannot be found by conventional methods of x-ray examination, abdominal aortography should be considered.

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FIG. 1.—Aortogram taken on July 11. Swelling revealed below the ureteral pelvis.

FIG. 2.—Aortogram taken on July 11, later phase. Nephrogram showing "blushing" in the renal substance.