felt that the first degree of agglutination might be too subtle for comparatively inexperienced personnel to recognize, and such results are therefore listed separately as "weak positives" in subsequent experiments. Thus, in Experiments 2 and 3, three results were possible in each experiment—"negative," "weak positive," and "positive."

The most suitable technique would be that in which there is the smallest number of false negatives and weak positives as compared with the standard method.

In Experiment 2 the centrifuging method was used for twenty minutes, as it was hoped that by lengthening the period of spinning the number of one-plus agglutinations would be reduced. It was also compared with the rapid method with two separate incubation periods of ten minutes each. This rapid method is often used in emergencies for Rh-typing, but inexperienced personnel complain of the numerous manipulations involved.

The results show that in 113 Rh-positive cases tested, the total of one-plus agglutinations plus false negatives was five for the twenty-minutes centrifuging and nine for the two ten-minutes rapid method, as compared with one in the standard technique. Thus the superiority of the twenty-minutes centrifuging method as compared with the two ten-minutes rapid method is established, the results being slightly better and the technique easier to carry out.

The results obtained by any Rh technique must depend upon the avidity of the Rh-typing serum supplied. One batch used in Experiment 2 was weaker than the rest, and it was while this was being used that a case was tested which gave a weak positive by the standard and false negatives with both the rapid and the centrifuging techniques.

In Experiments 1 and 2 no false positives were encountered—an important point in emergency Rh-typing.

Experiment 3 was carried out to compare the efficiency of the centrifuging technique with the rapid method when they were both used for a longer period, and also to find out if false positives occurred then. No false positives were encountered, and the efficiency of the centrifuging technique in the small series tested was found to be comparable with that of the standard method.

Summary and Conclusions

A new technique is described in which Rh-typing is carried out by spinning a suspension of the patient's cells with anti-D serum in a centrifuge heated to 37° C. by a thermostatically controlled jacket.

The twenty-minutes centrifuging method gives almost as reliable results as the standard two-hour method, with no false positives. It gives slightly better results than the two ten-minutes rapid method, and, since there are fewer manipulations, it is recommended as a procedure to be adopted in emergency Rh-typing.

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The *Bethlem Maudsley Hospital Gazette*, published quarterly, is a lively and entertaining journal produced for and by the staff of the Bethlem Royal Hospital and the Maudsley Hospital. The issue which came out at the end of last year contains all the usual features of a weekly professional journal, including editorials, letters to the editor, book reviews, reports of meetings, signed articles, and items of news about the hospital, and also reprints Professor Aubrey Lewis's Maudsley Lecture entitled "Henry Maudsley: his work and influence."

A FOREIGN BODY IN THE KIDNEY

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The following case is of interest because of the diagnostic confusion it caused and its unusual outcome.

Case Report

A boy of 3½ years was admitted to the Duchess of York Hospital for Babies, Manchester, on January 25, 1954. The history obtained at the time of admission was that he had been well until a month before, when he became listless and developed painful enlarged glands in his neck. Shortly afterwards his left ear began to discharge; this persisted until the time of admission. A week after the cervical adenitis developed his urine became dark. There was no dysuria, but he started to pass urine twice during the night. About the time his urine became dark puffiness of the eyes was noted. This decreased during the interval prior to admission. For two weeks before admission he had vomited occasionally. His appetite, usually good, had become poor and he had become fretful. The only relevant previous history was an admission to another hospital at the age of 1 year for repair of an inguinal hernia. Examination showed a well-nourished, lively, but rather fractious child, with slight puffiness under the eyes. There was no oedema elsewhere. The left external auditory canal was full of thick pus and there were moderately large glands palpable in the neck. No other abnormal signs were found. In view of the history a diagnosis of acute nephritis following an upper respiratory infection was made.

The urine contained albumin and many red cells but no casts. Blood urea was 55 mg. per 100 ml.; E.S.R., 70 mm. fall in first hour; haemoglobin, 56% (Sahli); white cell count, 12,400 per c.mm. (neutrophils 61%, lymphocytes 37%, monocytes 1%, Türk cells 1%); platelet count, 450,000 per c.mm.

The profuse haematuria persisted, but no casts were seen at any time. The urine output was good and the general condition satisfactory. After two weeks there was little change in his condition, and the diagnosis of nephritis was considered to be untenable. At this time the blood urea was 42 mg. per 100 ml.; E.S.R., 20 mm. fall in first hour; haemoglobin, 66%; white cells, 15,000 (neutrophils 54%, lymphocytes 41%, monocytes 1%, eosinophils 4%). The left ear was dry and the drum healed.

As the first step in a full investigation of the renal tract a straight x-ray film of the abdomen was taken. This showed a foreign body in the right upper abdomen. A barium meal showed that this body was in close relation to the duodenum, and an intravenous pyelogram indicated that it was also in close proximity to the right renal pelvis (see Fig.).

Operation was performed on February 16 under general anaesthesia. An incision was made in the line of the right twelfth rib, the anterior half of which was removed. The perinephric fascia was opened and the kidney mobilized. The upper half of the kidney was friable and swollen, and had a dark-red mottled appearance. It was very adherent to the surrounding tissues. The duodenum was firmly stuck to the anterior surface of the pelvis of the kidney. The foreign body could be felt passing from the duodenum into the upper part of the kidney. By careful dissection the

duodenum was separated from the kidney except at the site of the short fistulous track through which the foreign body could be felt to be passing. The fistula was divided round the foreign body, which was disengaged from the duodenum with a little difficulty because of the splayed-out ends, which were really broader than the diameter of the duodenal end of the fistula. It was then easily withdrawn from the kidney. No urine leaked from the sinus in the kidney, the external end of which was situated on the edge of the renal sinus just beyond its junction with the pelvis. It appeared to be of kidney substance only and to have no direct connexion

Radiograph showing relationship of foreign body to renal pelvis and duodenum.

with the caliceal system. A piece of perinephric fat was sutured over it. The small opening into the duodenum was closed with two layers of fine catgut and the wound closed in layers, a rubber drain being left to the perinephric space.

The foreign body was identified as a hair-grip of the type known as a "kirbigrip," which was 4.8 cm. long and showed some evidence of erosion of the surface. Microscopical examination of a small piece of the upper pole of the kidney which was removed showed gross interstitial haemorrhage.

The patient made excellent progress after operation and was discharged home three weeks later. Microscopic haematuria persisted for three months after discharge, but the number of red cells in the urine has shown a progressive decrease and they have now become very scanty. At the time of writing the blood urea was 32 mg. per 100 ml. and the child was very active and in excellent health.

The parents were interviewed when the foreign body was discovered, and they remembered that about four months before admission the child had announced one day that he had swallowed a hair-grip. When told he would have to go to the doctor he promptly denied having swallowed anything, and maintained this denial in the face of repeated questioning. Since he appeared perfectly well in the next few days the matter was forgotten. Two months later he had an unexplained illness in which he became listless and anorexic but had no local symptoms. He was examined several times by his own doctor, who found nothing to account for his illness, and after a week he resumed his usual robust health. From about this time his urine was noticed to be cloudy, but it did not become red until three weeks before admission to hospital.

Discussion

The remarkable feature of this case is the behaviour of the foreign body. It had become impacted in the duodenum, and the sharp ends had become firmly fixed against the medial wall of the bowel. Thereupon the rounded end slowly worked its way through the lateral wall and entered the kidney. This whole process was, completely silent—unless the vague unexplained malaise two months after the hair-grip was swallowed was to be attributed to it—and finally the child came to hospital presenting the picture of an acute nephritis. He had lost a considerable amount of blood from his renal tract, since his haemoglobin at the time of admission was only 55%.

The varieties of size and shape of foreign bodies which have successfully negotiated the alimentary tract are legion. As a general rule, those which traverse the oesophagus can be expelled per vias naturales. Thus Gross (1953) reported that only 43 of 615 to reach the stomach had to be removed by operation.

We have been able to find reports of four other cases in which swallowed foreign bodies have perforated the bowel quite silently and entered the kidney. All four were young children, and in all of them the symptoms were predominantly renal. The Table gives the relevant data on the five cases now on record.

Details of Five Recorded Cases

Case	Age in Years	Sex	Foreign Body	Symptoms	Duration of Symptoms (Months)	Operation
Capon and Wells (1938)	4	F	Kirbigrip	Frequency; haematuria	7	Nephrectomy
McEnery and Fox (1946)	2	M	Bobby pin	Fever; vomiting; haematuria; pyuria	7	Removal through duodenum
Mackby (1948)	3	F	" "	Frequency; cloudy urine; fever	6	" "
Bilger and Greiner (1949)	5	M	Hair-grip	Pyuria	4	Nephrectomy
Present case	3½	M	Kirbigrip	Haematuria; malaise; vomiting	1	Removal without opening duodenum

A bobby pin is the American equivalent of a kirbigrip. The child reported by Capon and Wells was known to have swallowed a hair-grip several months before the onset of symptoms. In none of the other cases was such an incident reported. The two American cases and the other British case are practically identical with ours. In all four the open end of the hair-grip had become stuck in the second part of the duodenum and the rounded end had perforated the wall and entered the kidney. In the French case the foreign body passed as far as the large bowel before being arrested.

These cases are so similar, and the sequence of events so remarkably alike, that we suggest that this be regarded as a definite syndrome. Toddlers are notoriously apt to put things in their mouths, and in the investigation of obscure symptoms in children of this age the possibility of a foreign body as the cause should always be borne in mind.

Summary

A boy of 3½ years developed profuse haematuria three months after swallowing a hair-grip. This was found to be due to arrest of the foreign body in the duodenum and penetration of the right kidney. The foreign body was removed at operation and complete recovery ensued. Four other cases in whom a similar sequence of events occurred are referred to.

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