J. O. R. STEWART: PORTAL GAS EMBOLISM

X-ray picture of liver region in Case 1, showing portal gas shadows (arrowed) extending to the periphery of the right lobe.

G. J. FRAENKEL AND J. CHASSAR MOIR:
CASE OF "LIGHTNING BURNS"

Photograph taken more than an hour after the flash of lightning, showing a fern-like pattern on patient's chest.

J. BRADSHAW: CASE OF ADVANCED ABDOMINAL
PREGNANCY

Lateral radiograph showing absence of any uterine shadow, and the foetal parts overlapping the mother's vertebral column.

or inadequately demonstrated in six. Thus only about half the cases admitted had acceptable x-ray films of this area. Barrett (1962) suspects that the same is true elsewhere. In the present series and in most of the published cases the gas was best seen in the recumbent film.

Recognition of the condition involves differential diagnosis from gas in the biliary system as a result of biliary-enteric fistula. The anatomical distribution of both systems is the same, but gas in the bile-ducts is confined to the common duct and its large proximal branches, and the gall-bladder may be seen. On the other hand, portal gas is seen in the peripheral radicles as a fine reticular pattern (see Fig., Special Plate). Susman and Senturia (1960) have explained the different distributions on the basis that gas within the portal blood-stream is carried centrifugally to the periphery, whereas gas in the biliary system is prevented from extending peripherally by the centripetal flow of bile.

In the present cases the underlying surgical condition was mesenteric vascular occlusion, and this has been the pathology in six of the nine adult cases reported. Of the remainder, two resulted from necrotizing enterocolitis (Wiot and Felson, 1961; Barrett, 1962) and one from diabetic ileus with congested bowel at post-mortem examination (Wiot and Felson, 1961). In adults, therefore, the common factor would seem to be intestinal necrosis permitting the passage of gas and gas-forming organisms from the gut lumen into the gut wall and then into the mesenteric vessels. The condition has not been seen in strangulation, presumably because the veins are effectively blocked by the strangulating agent.

Whatever the cause of the necrosis the x-ray appearance of portal gas embolism is a harbinger of early death, and so far no patient has recovered. There is no relationship between the presence of gas and the length of bowel involved; two of the patients with the longest infarcts showed no gas shadows and survived resection.

Because of the small number of cases reported, the composition of the gas and its bacterial content have not been fully investigated. However, *Clostridium welchii* was found in the portal blood at operation in one case (Barrett, 1962), and analysis of gas samples has shown a high percentage of carbon dioxide (Wiot and Felson, 1961).

Awareness of occurrence of portal gas embolisms and x-ray films taken in the recumbent position and including the liver region should lead to more frequent recognition and will help in indicating cases with a grave prognosis. In these, intensive pre-operative therapy with wide-spectrum antibiotics combined with anti-gas-gangrene serum might well be of value. None of the published cases has had a trial on this regime, but in the present state of our knowledge it would appear to be a logical step.

I wish to thank Mr. B. M. Truscott and Mr. P. H. R. Ghey for permission to report cases admitted under their care. I am very grateful to Dr. F. R. Berridge for his independent opinion on the x-ray films of suspected cases.

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Case of "Lightning Burns"

[WITH SPECIAL PLATE]

A sharp thunderstorm on a sultry Sunday afternoon was followed by the arrival in the hospital casualty department of an ambulance bearing a young undergraduate, dazed and shocked but beginning to recover consciousness. He had been struck by lightning.

A subsequent piecing together of information gave a fairly clear story. The young man's last memory before waking up in hospital was of saying to a fellow student, "Do you think it's safe to shelter under this tree?" The companion's story was that, while in the Botanical Gardens and sheltering from a sudden downpour of rain, there was a tremendous flash of lightning which for a few moments stunned him. On recovering control he found his friend lying at his feet apparently dead. Fortunately, help was quickly forthcoming, and it was then found that the victim was still breathing although quite unconscious.

After arrival in hospital the patient's condition quickly improved. Save for one exceptional circumstance, a physical examination showed no significant abnormality.

The one very remarkable feature was an extensive erythema of the face and trunk which, after the lapse of half an hour, was replaced with a fern-like pattern traced on the skin of the chest and, to a lesser extent, of the left side of the neck. So striking was this that an immediate request was made for a photograph, but as it was a Sunday afternoon some delay occurred until one of us improvised for the occasion.

It was now rather more than an hour after the event and already the "rash" was beginning to fade. However, enough remained to make a worth-while picture possible (see Fig., Special Plate).

The patient's subsequent course was satisfactory. The "rash" quickly faded and was only barely visible by next morning. His physical condition remained good, but he bitterly complained of aching pains throughout his body and limbs, and especially in the shoulder-girdle. The pains continued in diminishing degree for four or five days, after which time the patient was discharged from hospital. His subsequent progress was entirely satisfactory.

This case presents a striking example of the reaction of the skin to a discharge of high-powered static electricity over its surface.

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The "Società Italiana di Chirurgia Pediatrica" was recently created to promote progress in the art and science of paediatric surgery. Professor Pasquale Romualdi, head of the surgery department of the Hospital "Bambino Gesù" in Rome, has been appointed President of the Society for the first two-year term. The Society's official organ is the *Rivista di Chirurgia Pediatrica*, published by "Il Pensiero Scientifico," Rome. Details may be obtained from Dr. Franco Bergami, Divisione Chirurgica-Ospedale Bambino Gesù, Rome, Italy.