glassware, scalpels, and microtomes; splashes of chemical into the eyes and on to the skin; accidental ingestion of potentially hazardous chemicals; burns from hot or very cold objects; falls, including falls that are made worse by the student falling on to glassware being carried. Among the less common accidents are injuries from exploding glassware; electric shock; overexposure to ultraviolet radiation; contamination by radioactive material; inhalation of vapours of such materials as mercury and aniline; and infection by bacteria and viruses used in experiments, sometimes caused by mishandling of syringes.

These are fairly typical of the accidents reported in universities. Such accidents are investigated to establish the cause with a view to trying to prevent repetitions in the future.

Medical treatment and health surveillance

The facilities available for dealing with accidents and medical emergencies at a university are worked out in collaboration with the university medical officer who is invariably a member of the safety committees. Simple injuries may normally be dealt with

using first-aid materials held in departments. More severe cases that do not need hospital treatment will be treated by the university's health service.

A university's health service and medical officer will also have to arrange medical surveillance for certain members of the student population who may be subjected to particular risks. For example, students working with ionising radiation or lasers may need a pre-exposure medical examination; repeat examinations may also sometimes be necessary, especially if accidental high exposure has occurred or is suspected. Sometimes students may need to be immunised against certain diseases that could result from their work. Another example of the role of the university's health service in safety is arranging for the collection and analysis of urine samples in cases of suspected inhalation of mercury vapour and other hazardous materials.

A university's health service staff must always be on the lookout for possible "occupational" causes of diseases that their students develop, and close liaison with the university's safety personnel is most important. Also, general practitioners outside universities who have students as registered patients will need to remember a possible occupational cause of illnesses that their student patients might develop.

Occasional Review

Computerised tomography of acute traumatic intracranial haematoma: reliability of neurosurgeons' interpretations

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Summary

Two neurosurgeons concerned with the emergency management of patients with head injury correctly diagnosed the presence or absence of an acute intracranial haematoma in 97 scans that were presented to them without knowledge of the patients' clinical details. There were no false-positives or false-negatives, although identification of the type of haematoma was not always possible. The impact of the EMI scan on patient management demands new approaches to the care of head injuries.

Introduction

Detection of an intracranial haematoma may be crucial in the management of a patient with a head injury. Investigations

available previously, however, have disadvantages. Exploratory burr holes may fail to detect significant space-occupying lesions, particularly when these are in unusual sites.¹ The results of standard and computerised ultrasonic techniques may be unreliable in head injuries.^{2,3} Ventriculography may aggravate a tight brain and, like angiography, needs considerable skill to perform and interpret. Assessment of head injuries was one of the first areas in which the potential of computerised axial tomography (EMI scan) was recognised. The typical appearances of the various types of intracranial haematoma and the reduction in the use of alternative investigations that succeeded the introduction of EMI scanning have been described.⁴⁻⁶ Unfortunately, typical examples of the results of a new investigation sometimes prove in practice to be outnumbered by those that appear ambiguous to a clinician seeking guidance in a critical case. In view of the increasing importance of the EMI scanner we have investigated how reliably surgeons responsible for the emergency management of head-injured patients interpreted scans obtained in routine clinical practice.

Methods

One participating neurosurgeon reviewed the records of patients submitted to EMI scanning within two weeks of a head injury.⁷ He determined whether the patient had suffered an extradural, subdural or intracerebral lesion, or both—recording a "haematoma" if operation or necropsy had shown a focal traumatic space-occupying lesion of sufficient size to have been clinically relevant. "Smear" subdural haematomas were excluded. The scans of 100 patients were selected

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for review by the two other participants. Half of the scans were of patients in whom a supratentorial haematoma had been subsequently verified. The remainder were of patients classified as "diffuse brain damage." None of the latter required intracranial surgery, and in nine fatal cases no haematoma was found during necropsy.

Scans from three patients with diffuse damage were excluded on technical grounds, leaving 43 80 × 80 matrix scans and 54 performed using a 160 × 160 matrix. Scans from cases of haematoma and cases of diffuse damage were mixed randomly and read by a neurosurgical consultant and a registrar. They interpreted the scan appearances independently and without knowledge of the patient's clinical features. They each recorded whether any intracranial haematoma was present and, if so, whether it was extradural or intradural; and among the latter whether a discrete intracerebral component could be identified. They also commented on ventricular shift and whether areas of relatively increased intracranial density were present.

Results

Traumatic haematoma or a diffuse head injury?

The two neurosurgeons agreed about the presence or absence of a significant haematoma on the scan in all but two cases (table I). Surgeon A was confident that a haematoma was present in one patient, but his colleague was uncertain. Surgeon B was confident that there was no haematoma in another patient, while A was uncertain.

TABLE I—Comparison of two neurosurgeons' interpretations of EMI scans of 97 head-injured patients

EMI scan diagnosis				No of cases
Neurosurgeon A	..	..	Neurosurgeon B	
Haematoma	..	..	Haematoma	49
Haematoma	..	..	Uncertain	1
Uncertain	..	..	No haematoma	1
No haematoma	..	..	No haematoma	46

Management in practice may depend on settling such uncertainty in favour of the more definite of the two opinions; so to arrive at a combined assessment the confident surgeon's view was recorded in both of these cases. Comparison with the final diagnosis shows that the confident surgeon's interpretation was correct in both cases, the combined opinion of the two surgeons giving neither false-positive nor false-negative results (table II).

Type of haematoma

Ten of 13 extradural haematomas, 28 of 34 intradural haematomas, and one of three patients who had haematomas of both types were correctly identified (table III). Overall, 78% of haematomas were correctly separated into extradural or intradural varieties. In 11 of the patients with intradural haematomas the lesion was a discrete intraparenchymal clot. Each case was correctly identified by both surgeons.

Shift of the ventricles

Shift of the ventricles was observed in 49 of the patients with haematomas, one patient with an intracerebral haematoma having no midline shift. In none of the patients with diffuse head injury did the neurosurgeons definitely identify a midline shift, although both had some doubt about one particular patient.

An area of increased density

In 45 patients there was a sufficiently distinct area of increased density on the EMI scan to give positive indication of a haematoma. No area of increased density, however, was seen in the scans of three patients with intradural haematomas and one patient with an extradural haematoma. None of the patients with diffuse head injuries were considered to show dense lesions indicative of significant blood clots.

TABLE II—Comparison of combination of two neurosurgeons' opinions with eventual clinical/pathological diagnosis in 97 head-injured patients

EMI scan diagnosis	Final diagnosis	No of cases
Haematoma	Haematoma	50
No haematoma	Diffuse brain damage	47

TABLE III—Reliability of EMI scan in detecting type of acute traumatic intracranial haematoma

Type of haematoma	No of cases	Accurate EMI diagnosis
Extradural only	13	10
Intradural only	34	28
Subdural and intracerebral	23	17
Intracerebral only	11	11
Extra and intradural	3	1
Total	50	39(78%)

Discussion

The interpretation of the EMI scan appearances in other reports^{6,7} could have been biased by knowing the patient's clinical details, and an unduly optimistic appraisal of the value of the EMI scan in head injury might have resulted. Our study indicates, however, that the EMI scan is indeed reliable for determining whether or not a patient with a head injury has a significant space-occupying lesion. There was an extremely close correspondence between the independent assessments of two neurosurgeons and an exact agreement between their combined opinions and the final diagnosis.

Differentiation between different types of haematoma was not completely reliable: only 78% of cases were correctly recognised as being either extradural or intradural. Sometimes it was possible to decide that a haematoma was definitely intracerebral or subdural. In many cases with burst frontal or temporal lobes there was a combination of intracerebral damage and subdural blood, and classifying these simply as intradural haematomas is more realistic.

Clotted blood inside the cranium usually has a higher density than brain, and the diagnosis of haematoma in most cases was based on a combination of both ventricular shift and positive evidence of a collection of blood. In four patients, however, there was no area of increased density, but the surgeons participating correctly diagnosed haematoma from the appearance of compression of the ventricles and midline shift.

The participants in this study readily arrived at an opinion on most of the scans. Difficulty was experienced with several 80 × 80 scans obtained early in our experience that were obscured by movement artefact. Several scans had to be repeated under anaesthesia before satisfactory quality was obtained, and at present most of our patients with recent head injuries are anaesthetised for the investigation. In future development of more rapid scanning may make this less necessary. The patients in our study underwent scanning because a haematoma was initially suspected on clinical grounds. In an effort to detect haematomas at an earlier stage we have recently extended scanning to a limited number of patients with neurological dysfunction but without deteriorating clinical state. A surprising number of these proved to have positive results. Rather than operate indiscriminately on all these patients we have adopted an expectant policy in such cases, closely monitoring clinical condition and intracranial pressure.⁸ Only a few patients have shown progressive intracranial hypertension and needed surgery. In the others, intracranial pressure has progressively fallen, the clinical state has improved, and repeat EMI scanning has shown resolution of the haematoma. We are encouraged to continue this policy.

The reliability of the EMI scan in detecting traumatic intracranial haematoma offers a solution to one of the major problems in assessing the head-injured patient. Its value demands a fresh

approach to the management of patients with head injuries admitted to hospital. Routine investigation of selected groups of patients may lead to an earlier diagnosis of traumatic intracranial lesions. This need not necessarily lead to an increase in the number of patients undergoing operation but, we hope, in appropriate cases, to earlier and more successful surgery.

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Today's Treatment

Diseases of the alimentary system

Anorexia and loss of weight

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Appetite is a pleasant sensation related to previous gustatory experiences, whereas hunger—less common in a society where eating three or four meals daily has become a social habit—is disagreeable and associated with hunger pangs sometimes caused by unrequited gastric peristalsis. Appetite bears no relation to the need of the body so the amount of food eaten by man, which depends on social and environmental factors, is usually greater than he needs. Although obese people are blamed for their unrestrained appetite, some experiments¹ suggest that they may be less influenced by their viscera than people of normal weight. Normally, eating behaviour correlates closely with gastric motility and whether the stomach is empty or full; but the feeling of satiety may be absent or take longer to develop in obese people—so there is no brake to limit the appetite. Perhaps, however, this is acquired rather than constitutional and the result of disregarding the sensation of satiety.

Appetite is rightly regarded as an index of health, hence inquiry about it is part of the routine of every case history. Yet surprisingly little is known about the physiology of appetite. Animal experiments suggest the presence of a feeding centre in the lateral hypothalamus and a satiety centre situated more medially, which, if stimulated by cold or hypoglycaemia, could activate the lateral centre. So the hypothalamus is thought to regulate eating, and clinical pointers to this are the alleged rare tumours of the pituitary gland or suprasellar region that cause the patient either to starve or to over-eat. Yet the psyche exerts great influence: for the appearance, sight, smell, colour, texture, and consistency of foods are such important external stimuli. Every dietitian knows this, and convalescent patients easily

lose their appetite if served meals that are too large or look uninteresting.

The stomach itself may play only a minor part. Pavlov described the conditioned reflex sparked off by the sight of food—salivation with increased gastric tone and secretion. Patients suffering from pernicious anaemia, however, who have neither gastric acid nor pepsin eat normally unless their tongue is sore from B₁₂ deficiency. Lesions of the stomach, even early cancer, do not diminish appetite. Gastritis, as seen endoscopically, is common in healthy people with normal appetite. Peptic ulcer does not cause anorexia but appetite may be depressed for fear of eating. Gastric operations such as partial gastrectomy, however, reduce appetite, probably because of an inability to eat large meals owing to the small size of the stomach. Fear inhibits motility, and sudden loss of gastric tone can be seen by the radiologist when bad news is given to someone during a barium meal; but this loss of tone may be the effect of the psyche and not the cause of anorexia, for one sees patients whose appetite is normal despite gastric hypotonia. Hypoglycaemia increases appetite, but there is no indication that hyperglycaemia depresses it—for example, the obese diabetic patient whose blood sugar is high still finds it difficult to diet.

Causes of anorexia

Anorexia, when it occurs alone, is usually psychogenic; but because it is an expected symptom of many conditions organic disease must be excluded. All types of fever depress appetite as do chronic inflammatory states like active rheumatoid arthritis or granulomata of the bowel such as ulcerative colitis or Crohn's disease. Abnormal metabolic states may present with anorexia. Uraemia, which also causes early morning sickness, is usually excluded by testing the urine. The apathy and anorexia of early Addison's disease may be caused by either hyponatraemia or hypercalcaemia. Hypercalcaemia can mimic neurosis by causing anorexia and depression; this occurs in sarcoidosis, hyperparathyroidism, carcinomatous deposits in the bone,

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