

CASE STUDIES
IN
MEDICAL MALPRACTICE

by

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HOW TO USE THIS BOOK

IF YOU ARE NOT A MEDICAL PRACTITIONER

When you meet an unfamiliar word, do not skip it, as you will soon be lost. The link to the medical dictionary is there for that reason. Use it! Spelling is English not American. For example *Hemoglobin [US]* is given in its original form as *haemoglobin [UK and Australian]*.

Unlike texts on atomic physics, medical texts are largely descriptive, and do not require from the reader much more than a knowledge of terminology to be immediately comprehensible even to the non medical reader. Thus:

“atrophy” means “wasting away”.

“cystoscopy” means looking inside the bladder.

“carcinoma” means a cancer growing on the lining of an organ or the skin.

If the definition requires you look up a subsidiary word look that up too. Then read on.

CHAPTER TWO

DIAGNOSIS

Undoubtedly, diagnosis is the fundamental part of the art of medicine. It is here, in the initial phase of contact between doctor and patient, that the groundwork is established for success or failure in treatment. It is the area where most mistakes are made, and yet, strangely enough, it is not the commonest subject of litigation by patient plaintiffs. Errors during treatment, particularly surgical treatment, exceed them by far.

Again and again one notes that it is things done to or for patients during the course of treatment which are the most potent in initiating legal action. The most significant co-factor is a slight or insult felt by the patient, e.g. the doctor telling the patient not to bother him with his imagined symptoms. If the 'imagined' symptoms turn out to be real, the doctor will frequently find himself in a difficult situation. It is always wiser to say: 'I can find nothing abnormal' than to state dogmatically: 'There is nothing wrong with you.'

Case 28 MDU

Following an outpatient consultation a barium meal examination was carried out on a 76 year-old man who had presented with a variety of symptoms including indigestion and epigastric pain. When the patient attended for review the result of the X-ray was not in his notes and the physician concerned omitted to obtain it. The patient's symptoms had settled and since the other investigations were normal he was discharged from the clinic. Unfortunately the X-ray had demonstrated a probable carcinomatous infiltration of the stomach. The symptoms returned and his family, having been assured that there was no apparent physical cause, arranged for him to be seen by a consultant psychiatrist. He was admitted to a psychiatric unit where he suffered a myocardial infarction and died. The post mortem revealed the carcinoma.

The family issued a claim for the man's unnecessary suffering and it was settled.

The consequences of an error in diagnosis

An error in diagnosis will lead to correct treatment only accidentally. Here is an example.

Case 29

An elderly man saw his doctor complaining of R sided chest pain. He said there was pain in a broad area and it was not aggravated by breathing. The doctor diagnosed fibrositis and prescribed a mild analgesic. A few days later the tell-tale signs of shingles became apparent.

Comment There was no harm in the treatment prescribed as there was no specific treatment for shingles in current use at that time.

The cases we shall study in the remainder of this chapter rarely had such a pleasant outcome.

Negligence in diagnosis

Arriving at a correct diagnosis is frequently very difficult. Whereas car mechanic can undo screws and nuts and determine what is wrong with an engine, something similar is not possible in medical diagnosis. Often the clinician is faced with the need to accept the most likely of a number of diagnoses. Errors are therefore inevitable even when all reasonable diagnostic methods have been exhausted. It has often been said that a good doctor is one who comes to the right conclusion on inadequate evidence. It is impossible never to be wrong in diagnosis, and to expect this places a burden on the practitioner which is impossible to meet.

The questions to be asked are (1) was a reasonable diagnostic effort made, and (2) were the conclusions drawn appropriate?

Inadequate standard of care can be alleged in the following circumstances:

- . Failure to take an adequate history of the condition.
- . Failure to examine adequately
- . Failure to order the appropriate investigations
- . Failure to draw reasonable conclusions from the above

MAKING A DIAGNOSIS

A diagnosis is made through a three stage process comprising:

- . history taking
- . clinical examination
- . performance of special investigations

Continuing diagnostic endeavour

During the subsequent management of the patient, this process may be repeated frequently and diagnoses may therefore need to be revised as new information comes to hand. Failure to diagnose initially is often excusable, but it may not be some days or weeks later.

Diagnosis not attained

After the first consultation, it may not be possible to reach anything other than a provisional diagnosis. If a hundred patients selected at random from passers-by with symptoms of some kind were to be submitted for diagnosis of these symptoms, it is distinctly possible that the majority would not be diagnosable with a high degree of confidence. Many trivial complaints have at present only a vaguely diagnosable origin, e.g. as isolated symptoms, any of the following: nausea, halitosis, indefinable malaise, short-lived episodes of diarrhoea. The doctor may well say: it may be a virus going around. He cannot be called to account in such circumstances,

Moreover, it is impractical to undertake a major diagnostic endeavour in all patients presenting with ill-defined symptoms. There are not enough medical practitioners to handle such an attempt. Hence, one of the first questions the diagnostician must ask himself is whether the symptoms and clinical findings are worth following up and investigating further. From time to time, errors will be made. The question then is whether it was an error of judgment or whether it went 'beyond the pale' and was simply not good enough. Here is one in the latter category.

Case 30

A middle-aged man complained for months of pain in his buttock and back. His doctor kept giving him pain relieving tablets for 'arthritis'. Eventually, the man, who was rather timid, asked very respectfully if the doctor might care to examine him as he could no longer put on his trousers. When the doctor finally examined the patient he found, to his horror, that the patient had a huge malignant tumour of the buttock.

Comment

This was many years ago, when le sou medical was not as common. No litigation ensued. Had it done so, what damage could the patient have proved? The sarcoma would almost certainly have been the cause of his death whenever it was treated although the courts would hardly have been overly impressed with the diagnostic effort. Of course, the diagnostic delay may have hastened his end, but this might have been difficult to prove.

Below is another case where the diagnostic endeavour was not awe inspiring.

Case 31 MDU

A 29-year-old woman telephoned her family doctor because of a headache. He advised her to take Panadol and to attend surgery the next day. She did so, still complaining of headache, and with visual disturbance. The doctor diagnosed and treated migraine. The following day her husband told the doctor over the telephone that the illness was continuing with headache, giddiness and double vision. A further prescription for analgesics was given and the husband was asked to report progress. Next day the doctor was told by telephone that the headache was better, but the patient was drowsy.

There was a conflict of evidence about the next development. The husband said that he had informed the doctor that as well as drowsiness his wife was complaining of numbness in the right arm. The doctor had no recollection of this. On the sixth day after the onset of the headache the doctor was told over the telephone that the patient was agitated and uncontrollable. He did not visit but prescribed Largactil. Later that day the woman was admitted to hospital unconscious and she died from pyogenic meningitis.

The widower complained first to the family practitioner committee and then instructed solicitors to claim against the doctor, who sought the Union's help. The claim was considered to be indefensible and was settled.

Comment There was really no attempt made to arrive at a diagnosis.

Partial Diagnosis

Often a partial diagnosis, sufficient to lead to appropriate management is all that is possible. This is particularly so in emergency situations.

Case 32

A coal miner was injured in the abdomen by a coal skip. A diagnosis of peritonitis was made which was thought to be due to bowel injury. At operation an acutely inflamed appendix was removed.

Comment The partial diagnosis of peritonitis was correct but the origin of the peritonitis was discovered only at operation. The partial diagnosis was sufficient to lead to the correct action.

Failure of diagnosis in complex cases

In very complex cases it may not be possible to achieve a satisfactory diagnosis. In some, tragically, the correct diagnosis is revealed only at necropsy; yet it does not necessarily follow that there will be any evidence of negligence. It may have been extremely difficult to reach a diagnosis.

Case 33

A middle-aged man was admitted to hospital having lost a great deal of weight. He complained of breathlessness and extreme lassitude. Thorough investigation of blood samples and radiological investigation of chest, alimentary tract, kidneys and so on, during the short time that he lived following admission to hospital, failed to reveal any abnormality. He died, and at necropsy disseminated cancer was found, with tiny seed like deposits in almost every organ. Even the pathologist was unable to locate the site of the primary tumour, but he thought that the lung was the most likely one.

Case 34

Over 20 years ago, before CT scans and ultrasound were available as diagnostic tools and before endoscopy had become a useful investigation, an elderly man presented with severe upper abdominal pain which radiated through to his back. The pain was constant and prevented him from sleeping. Apart from that he had no other symptoms. A full set of X-ray examinations including barium meal, barium enema, cholecystography and a small bowel series revealed no abnormality. His blood, biochemical and other analyses were absolutely normal and he was losing no weight.

In the past he had attended a psychiatrist for a multitude of hysterical symptoms stretching over a period of ten years. His consultant decided to reassure him that there was nothing wrong.

About 12 months after this reassurance was given, he had lost a good deal of weight and then developed jaundice. Re-examination at this time revealed that he had an enlarged knobby liver and at laparotomy it was found that he had a carcinoma of the body of the pancreas with secondary deposits in the liver. Only palliative surgery was undertaken and he died some six months after the laparotomy.

Comment In my view, neither of these last two cases were ones where allegations of negligence could have been sustained in Australia. As regards the second case, the mortality rate of cancer of the pancreas is very great, and as there are almost no five year survivors from this disease, however early diagnosed, it is doubtful whether early diagnosis would have saved him from anything other than a certain amount of mental anguish at not being believed that there was a physical explanation for the pain.

Today, it is often possible to make an earlier diagnosis of cancer of the pancreas by means of ultrasound or CT scans but it is very doubtful whether this will improve the surgical outlook for a significant number of such patients with current therapy.

Finally, here is a complex case where failure to diagnose was not an indication of negligence, even though it affected some four to five million persons following an outbreak of smallpox.

Case 35 MDU

When there has been a mishap in the management of a patient the hospital authority may arrange an inquiry and in a disastrous and possibly blameworthy case the medical and other staff may be told that they are entitled to be legally represented. If the nature of the illness has attracted much attention the Secretary of State may order a public inquiry. After the outbreak of smallpox in June 1973, which resulted in the death of two people who had visited a patient, an inquiry lasted for 30 hearing days. The Union's solicitor represented a number of the medical staff of the hospital.

A young technician concerned with the investigation of fungal diseases had access to a pox virus laboratory in which smallpox was harvested for research purposes. She developed fever and a slight rash and was sent by her family doctor for admission to a teaching hospital. She was admitted to a medical ward and was examined by the casualty officer, the house physician and the medical registrar. A full history was taken and investigations, including a serum precipitin test to fungi, were set in train. Her condition improved and the rash had almost disappeared by the time the patient was seen by the physician on his ward round and it was thought that she had glandular fever. Learning that she was in hospital, a superior at the laboratory asked for a sample of serum and skin scrapings from the pustules so that the possibility of a fungal infection could be further considered. The tests were negative. Those at the laboratory then thought of the possibility of monkey pox and another member of the laboratory staff visiting the patient took further skin scrapings, as it happened without the knowledge of the medical or nursing staff. This sample was examined by electron microscopy which disclosed pox virus particles. The next day the clinicians at the hospital were notified and were informed for the first time that smallpox was harvested at the laboratory and that on a recent occasion the patient had watched this process being carried out. The patient was transferred to an isolation hospital and subsequently single lesion sample tests disclosed that she had suffered from a highly modified form of smallpox from which she rapidly recovered. Meanwhile, the local authorities were notified and the tracing and vaccination of contacts was started. Unhappily this did not bring into the net the son and daughter-in-law of a married woman who had been in the next bed to the smallpox patient and with whom they had had slight physical contact. Before they could be traced these relatives contracted smallpox and died.

The Union's solicitor was present throughout the inquiry and members of the secretariat attended numerous conferences with counsel and solicitors instructed by the different boroughs to represent the interests of their medical, public health and administrative staff in order to ensure that the professional interests of the members of the Union were protected. The report of the Committee was published on 18 June 1974. Dealing with the position of the clinicians at the hospital, the Committee said:

So modified were (the patient's) symptoms that we are satisfied that no medical practitioner could have been expected to diagnose smallpox, even as a possibility, in the absence of some knowledge that she had been in contact with a source of infection. Thus there is no criticism to be made of any of the clinicians who were concerned with her

case. Indeed, we were impressed by the detailed study made of her illness at (the hospital).

The Committee said that this outbreak, which had resulted in the vaccination of some four to five million people and a cost in financial terms running into millions of pounds, had shown that the requirements of communicable disease control in a complex and increasingly urban society demand a high degree of readiness and a well integrated organisation if a disease such as smallpox is to be effectively contained. The Committee made a large number of recommendations - in particular the appointment upon a regional basis of specialist epidemiologists charged with the duty, in the event of an outbreak of communicable disease, of going to the place of the outbreak and advising and assisting in its control.

HISTORY TAKING

Ideally, the history is recorded as told by the patient. However, some guidance is required as otherwise the patient may become discursive, deal with aspects that are not important and fail to mention those that are. While leading questions should be avoided, as there is the risk of putting words into the patient's mouth this is more of an ideal than a practical possibility, in terms of everyday clinical practice,. But avoidance of leading questions must be exercised absolutely on some occasions, particularly when the patient can be easily persuaded to say yes to almost anything -- e.g. a child. One technique which partly circumvents this problem is to offer the patient a number of alternatives when he has difficulty describing what he feels. For example, he may be asked whether any of the following terms correctly describes his pain: burning, cutting, griping, stabbing, aching or gnawing.

Direct questioning

When the patient has exhausted his own story, the doctor undertakes direct questioning when appropriate, remembering that the results of such questioning may lead to inaccuracies. It is nonetheless essential as the following case shows.

Case 36

A common cause of failure to diagnose is the patient's reluctance to divulge symptoms he fears are due to cancer.

A middle aged man presented with the diagnosis, made by another practitioner, of an inguinal hernia. The diagnosis had been made many years ago and he now wanted a 'second opinion'. He had never noticed a lump, and on examination no evidence of hernia could be found. This naturally aroused suspicion: why was this man now, after all this time, seeking a second opinion? Only at the point where he was about to be examined, and upon direct questioning, did he admit to passing blood per rectum. Sigmoidoscopy

revealed an early rectal cancer which was treated surgically. He failed to attend regular follow up after surgery.

The significant clinical features depend upon the particular disease or injury. Sometimes the history can be written down in a few seconds. Thus, the patient may complain of a lump on the surface of the skin which generally has no other complaints attached to it. He may be concerned that the lump is cancerous.

In other cases history taking has to be extremely detailed and can be very time-consuming. This applies particularly to conditions affecting the central nervous system, and the digestive organs, but adequacy of detail is important in all cases.

Pain

Of all clinical symptoms, pain is the most important. It is necessary to determine the type of each pain (gripping, stabbing etc.) and whether it is constant or intermittent; whether it comes in waves which rise to a crescendo and then slowly abate or whether its intensity level is constant over the period of the attack.

Ancillary features associated with the attacks of pain are significant. Thus, a patient suffering from a myocardial infarction will often experience a feeling of impending doom and break out into a cold sweat; he will tend to lie still. In contrast to this, a patient with inflammation of the gall bladder (cholecystitis) will have episodes of pain lasting some hours during which time she will generally be very restless, trying to obtain some degree of comfort by adopting one position after another or walking about. Associated with the attack may be episodes of vomiting or retching. A patient with pleurisy will often experience pain every time he takes a breath. All these associated features of pain are extremely important indicators of where the main diagnostic effort should be directed.

Bleeding

Another symptom of extreme diagnostic importance is bleeding from almost any orifice or point of the body. The one exception is haemospermia (blood in the semen) which is usually of no diagnostic import.

Thus, a black skin mole which bleeds upon trivial contact, is likely to be malignant. The coughing of blood (haemoptysis) is frequently indicative of serious lung pathology, for example, lung cancer or tuberculosis. Bleeding from the rectum is almost always due to haemorrhoids, but may be due to serious diseases such as bowel cancer or ulcerative colitis. In the latter two conditions, the bleeding is often associated with the passage of mucus and a change of bowel evacuation pattern. Such symptoms must heighten the clinician's suspicion of serious underlying pathology, that is, something more serious than haemorrhoids.

Swellings and lumps

The most important features of swellings are what one can find on examination, but the history can still be very useful. Thus a patient with a hernia will frequently state, if asked, that the swelling disappears when he lies down. The duration of the swelling is also very important. A lump that has been present without increase in size for some years is unlikely to be cancerous. Of course, the patient must be a reliable witness.

Alteration of bodily functions

Every person gets to know his own body. He knows, approximately, how often his bowel works and how frequently he passes urine. He knows that if he walks up a flight of stairs in a building he frequents that he will not be panting for air. If any of these things change, they may herald an illness requiring investigation.

Dyspnoea (shortness of breath) is present in many cases of heart and lung disease. It may also be a symptom of severe anaemia.

Alteration of frequency of bowel movement is common in both serious and trivial bowel problems. Of great significance are the passage of huge volumes of faeces (which can lead to dehydration and death, particularly in children) and alterations of bowel habit which continue especially if the symptom becomes progressively worse.

Alteration of micturition pattern is common in urinary tract infections and urinary obstruction; in the latter case, the urinary stream is poor.

These are merely some of the host of symptoms of which patients may complain. The reference made to possible causes of these symptoms outlined above is, needless to say, not exhaustive.

Occupational disease

In addition to such clinical symptoms, the clue to a diagnosis may lie in the work which the person performs (e.g. in occupational overuse syndrome, asbestosis, some cases of renal cancer, Weil's disease). Without that knowledge, the diagnosis may be long delayed.

Case 37 MDU

When a person's work puts him at hazard of a particular disease, it is usual for the

employers to take steps to minimise the risk. It is not widely known that sewer workers are issued with green cards by their employing authorities, to draw attention to the risk of leptospirosis or Weil's disease. When a man who works in sewers is injured and presents himself for treatment, it may be impossible for the doctor in attendance to know of the

hazard if the patient does not volunteer the nature of his occupation, nor produce the green card.

A 44 year-old man attended the accident department of a general hospital, having injured the middle finger of his left hand at work. The doctor who treated him noted that the nail had been 'almost completely crushed at work - got it caught in something'. The nail was removed and the nail bed cleaned, tulle gras being applied. The patient was asked to return for review two days later. The doctor had difficulty in obtaining a history because the patient's accent was not clear but he had unquestionably done his best on the information given to him. The patient did not return two days later because he was by then too ill, having been admitted to an infectious diseases hospital where Weil's disease was later diagnosed. The patient died within two or three days of admission. Solicitors for the widow claimed damages alleging that the risk should have been appreciated and guarded against by the casualty officer who first saw the man after his injury. The Union instructed its solicitor to deny liability and the claim was not pursued. It turned out that the man had had a green card which he had not presented at the casualty department.

Comment In the circumstances the diagnostic endeavour was adequate. In the following case it was not.

Case 38 MDU

The relatives of a 62 year-old man who died from typhoid fever criticised the general practitioner for failure of diagnosis and treatment. His wife had telephoned the doctor to say that her husband would be coming to see him because he had been unwell for two weeks and had lost weight. The man complained of giddiness and sweating. The General Practitioner found nothing abnormal but diagnosed influenza. A week later, the man being no better, blood and urine tests and a chest X-ray were arranged. Two days later he had lost his appetite and had diarrhoea for which Panadeine Co. was prescribed. Next day his wife reported that he still had diarrhoea. The member asked her to collect a prescription for Lomotil and agreed to visit later that day; by then the diarrhoea had ceased. The doctor gave advice and asked to be kept informed. The blood tests were normal, but at the next visit the General Practitioner found the patient dehydrated and weak but not seriously ill. Admission to hospital was arranged and the referral letter, recording that the patient was a bottle cleaner in a public health authority laboratory, queried the nature of the infection.

Extensive investigations were carried out but the diagnosis was not made at once. Three days after admission the patient was worse with fever and abdominal signs; typhoid fever was diagnosed. He died despite treatment. Autopsy showed perforation, peritonitis and septicaemia. The member was represented at the inquest, at which a verdict of death from industrial disease was recorded.

Comment Had the patient been diagnosed earlier, his life might have been saved. Typhoid fever responded to treatment with chloramphenicol at that time. Today other antibiotics, e.g. ciprofloxacin and ceftriaxone are employed.

Post-splenectomy Infection

Splenectomy is usually required when a spleen ruptures after trauma. Very occasionally, after splenectomy, the patient's resistance to infection is lowered and he becomes prone to a syndrome called overwhelming post-splenectomy infection (OPSI).

One such case is included here because, although it is a rare cause of litigation, it indicates that rarity and consequent difficulty in diagnosis is not necessarily a defence.

Case 38.1 MDU

A 19-year-old man was admitted under a consultant physician because of fever and sore throat. Ten years previously there had been splenectomy for trauma. The doctors diagnosed a viral infection and did not prescribe an antibiotic. Sixteen hours after admission to hospital the patient collapsed and died. At post-mortem the cause of death was found to be pneumococcal septicaemia with bilateral adrenal haemorrhage. Later the patient's mother brought proceedings in negligence.

The [MDU] Council considered that it was not negligent to diagnose a viral upper respiratory tract infection in a young man with a sore throat and fever, but regretted that no precautions had been taken against the more serious possibility of septicaemia in a post-splenectomy patient. It was felt that having taken blood for culture, penicillin ought to have been started and might have been life-saving.

An expert adviser reviewed the conflicting evidence about a raised incidence of infection in adults following splenectomy for trauma. A possible defence to the action was considered on the grounds that septicaemia months or years after splenectomy is said by some to be rare in this age group, and that the symptoms could have been caused by a viral infection for which the treatment given would have been appropriate. However, the severity of the patient's illness had not been recognised and the withholding of penicillin did not seem to be very sensible or defensible. It could not be denied that had penicillin been given the chances of survival would have been substantially greater.

The Social Circumstances

The circumstances in which the patient finds himself are sometimes of great importance and may be the clue to the diagnosis. Thus multiple fractures in a child should arouse suspicion of the battered baby syndrome, although such fractures may be caused by a congenital disease (fragilitas ossium, also called osteogenesis imperfecta). Here, as in all diagnostic endeavours, it is important not to jump to conclusions.

Then again, chronic alcoholism may be the clue to the cause of ascites, which usually in such patients would be due to cirrhotic liver disease; liver biopsy would confirm the diagnosis.

Environment

Apart from health hazards in the workplace, the 'natural' environment is not free from unexpected danger.

Travellers returning from abroad frequently fail to mention that they have visited areas where serious diseases like malaria are common. This is particularly so when symptoms of disease do not appear immediately upon return to their home country. Of these malaria is the one most commonly missed.

Case 39 MDU

We have commented in previous annual reports on how easy it is to miss the diagnosis of malaria. Below are the opening words of a report from one of the many experts to whom the Union turned for advice with another case of delayed diagnosis.

This story is typical of those of fatal falciparum malaria, the main feature being delay in making the diagnosis, in this instance not until autopsy was carried out. Characteristically the patient returns to this country from an area endemic for this kind of malaria and within the two following weeks becomes unwell; a diagnosis of influenza is often made. However, the patient does not improve and after perhaps five to seven days his condition deteriorates often with change in consciousness.....

A 48-year-old alcoholic who had recently returned from West Africa had hallucinations: he thought that there were people in the wardrobe. His wife telephoned the general practitioner and was told that the hallucinations were attributable to alcoholism. After a restless night with further hallucinations the General Practitioner arranged admission by telephone to a psychiatric hospital. He was then delayed at the surgery and although he visited the house the patient had already left for the hospital. On admission he was unaccompanied and was so vague and rambling that it was impossible to take a proper history and full assessment was postponed. Next day the patient collapsed. He was immediately transferred to the District General Hospital but died. Autopsy showed cerebral malaria.

Within months the widow instructed solicitors to make a claim and the Union took advice from a number of eminent experts. One pointed out the rarity of cerebral malaria and the difficulties of diagnosis even when the most immaculate history is taken. The general practitioner experts had some sympathy with the difficulties faced by the family doctor but when the claim was considered by the Council of the Union particular attention was paid to the advice of the expert who said that, had proper management been instituted at any time up to the point when the patient suddenly collapsed, the chances of recovery would have been more than 90 per cent.

The case was eventually settled and the health authority made a contribution.

CLINICAL EXAMINATION

Inspection

This may reveal changes of colour, contour and other changes of the skin and mucosae, and the presence of swellings, ulcers and so forth.

Palpation

After inspection comes palpation. It may reveal the presence of masses or lumps not visible to the naked eye. In this category come most abdominal and breast swellings. An acutely inflamed area on or close to the skin surface may be warmer than surrounding parts, and tender. More deeply placed inflammations may still be tender (e.g. appendicitis) but the local temperature differentiation will not be evident although, of course, the patient's temperature may be generally elevated. Very deeply placed abscesses (e.g. of the brain, the lungs, or the subphrenic area) usually reveal no readily determinable local clinical signs.

Generally speaking, lumps are more readily palpable than visible, although this is not always the case. The nature of the swelling is recorded and in particular whether it is hard, firm, rubbery, soft or fluctuant. Hard swellings tend to be malignant (not invariably) and soft swellings tend to be non-malignant. A fluctuant swelling usually indicates the presence of a cyst or other collection of fluid.

Palpation includes examination of the mouth, and of the pelvic organs through the vagina and rectum with a gloved hand. Abnormalities including tenderness may be detected in this way.

Percussion

After palpation comes percussion when appropriate. The examining clinician places his fingers over an area of the body and taps one with a finger of the other hand. This enables him to determine whether the area is 'hollow' or solid in much the same way as a vintner determines whether his barrels are full or empty. An area is 'resonant' (hollow sounding) if it is occupied by an underlying air-containing organ such as lung or bowel, or when there is an underlying air-containing cavity, e.g. a large pneumoperitoneum (gas in the peritoneal cavity). The percussion note is dull when underlying the body's covering is an organ which is solid (e.g. the liver) or if there is liquid in the area (e.g. a collection of liquid in the chest [pleural effusion] or in the abdomen [ascites]). If the liver is enlarged the normal area of liver dullness is increased in size. In fat patients percussion is often an unreliable sign.

With the availability of special investigations, such as ultrasound, less reliance is being placed on percussion as a clinical sign.

Auscultation

This is the erudite name given to examination with a stethoscope. This instrument has its main role in examination of the lungs and heart, but it is also useful in determining the existence of bruits (French = noises) in arteries consequent upon vascular narrowing, and in tissues with an abnormally increased blood supply. Blood pressure readings with the aid of the stethoscope enable systolic and diastolic readings to be made.

Auscultation of the lungs may reveal the absence of breath sounds indicating either lack of gaseous exchange through that part of the lung or the presence of liquid or a gas between the lung and the chest wall. In addition to changes in the intensity of the breath sounds on one side compared with the other, adventitious sounds such as rales and crepitations (little bubbling noises) and/or rhonchi (squeaky musical sounds) may be heard. Rales and crepitations indicate that there is liquid present in the smaller tubes and alveolar sacs whereas rhonchi are generally an indication of a wheezy condition such as bronchial asthma caused by spasm of the bronchiolar musculature.

Auscultation of the heart will reveal abnormalities of rhythm and murmurs, the latter indicating turbulence of blood flow within the heart. Such turbulence is often caused by valvular disease. Systolic murmurs may be innocent if heard only at the apex of the heart, but they may indicate narrowing (stenosis) of the aortic or pulmonary valves; those heard throughout diastole indicate valvular incompetence of the same valves. A pre-systolic murmur is diagnostic of mitral valve stenosis and so on. The continuous 'machinery murmur' of persistent ductus arteriosus (a post-birth defect) is well known.

Auscultation of the heart is not very helpful in diagnosing disorders caused by poor blood flow in the coronary arteries, such as angina and myocardial infarction. Here recourse must be had to special investigations such as electrocardiography and coronary angiography (q.v.).

Special investigations such as the latter must be interpreted by personnel trained to do so.

Case 40 MDU

A 49-year-old lorry driver attended an accident department complaining of chest pain and numbness of the left arm and was seen by a medical student and a casualty officer. The patient gave a history of rib fractures two months earlier but otherwise appeared to be fit and no abnormalities were found on examination. An ECG was taken by the medical student and examined by the casualty officer who, thinking that the trace was abnormal,

called in the medical senior registrar. He decided that no acute changes were shown on the ECG and that the pain was musculo-skeletal in origin. The patient was discharged with an appointment at the cardiological out-patient department 'for further reassurance', but died at home next day.

When the senior registrar re-examined the ECG trace he saw evidence of an acute inferior infarct with an unstable heart rhythm. Post-mortem examination confirmed myocardial infarction. The two members were represented at the inquest and in connection with the subsequent negligence claim. An independent expert advised that the acute changes should have been recognised and the patient admitted to hospital. He might then have had a 70 per cent chance of recovery from his first heart attack, so settlement of the widow's claim was inevitable.

Comment The casualty officer who referred the problem to a senior colleague must surely have been exonerated. Hospitals frequently staff casualty departments with junior medical officers with inadequate experience. Senior medical registrars usually do have the necessary experience, and the hospital cannot therefore in this instance accept any direct blame, although there would be vicarious liability. Unfortunately such occurrences are not rare.

The Pulse

The pulse rate with the body mentally and physically at rest should be between 60 and 80 beats per minute in adults. A pulse rate over 100 per minute at rest is certainly abnormal. It can be caused by a large number of conditions, but most commonly it indicates infection. The heart rate may also rise when the heart has to do extra work, e.g. in some forms of heart failure, in thyrotoxicosis and in severe anaemia. Pulse rates of over 200 can occur in atrial flutter.

The rhythm of the pulse is also important. There is a slight normal variation with each breathing cycle which is usually barely detectable clinically. Extrasystoles occur when the ventricles of the heart contract extra times during the cardiac cycle; they may be of no significance. Atrial fibrillation, indicative of heart disease as a rule, produces a pulse rate which is irregularly irregular. It persists even when the patient does some gentle exercise whereas extrasystoles tend to disappear.

Other methods of clinical examination are less frequent. These include transillumination which is little used by experienced clinicians except in teaching demonstrations for students. It can be misleading because skin and subcutaneous tissues diffuse light around the part being examined.

Instrumental Clinical Examination

Further clinical examination can be conducted by means of simple instruments. These examinations are considered part of the clinical examination.

For example:

- . the nasal passages and the throat by means of small warmed mirrors;
- . the ears by an auriscope;
- . the eye by means of an ophthalmoscope and retinoscope;
- . the nervous system by the use of pins and cotton wool (for testing sensation), tuning forks (vibration sense), plessors (testing reflexes), and so on.

Two instrumental readings in common clinical use are the recording of the temperature and the blood pressure.

Temperature

The normal temperature lies between about 36.5 degrees C and 37.2 degrees C. Elevations of temperature occur typically in patients with bacterial and viral infections, but minor elevations can occur in other conditions. In severe infections, the body may not respond, and the temperature may be subnormal. Elevations of temperature are accompanied by increases in the pulse rate.

Blood Pressure

The patient must be at rest as for pulse readings. All too often the patient's blood pressure is recorded while the patient is not rested and not lying down; such readings are meaningless and may lead to non-existent 'high blood pressure'. The blood pressure is recorded by means of a manometer connected to a cuff which is wound round an arm and inflated with air. A stethoscope placed over the brachial artery at the elbow records the first squirts of blood allowed through as the cuff is deflated: this is the systolic pressure. As the cuff is deflated further, the sounds suddenly disappear: this is noted as the diastolic pressure. The normal range among adult Caucasians living in 'Western' countries is as follows:

Systolic blood pressure 100 to 140 mm of mercury

Diastolic blood pressure up to 80 mm of mercury.

Readings above these levels indicate the presence of hypertension; if the systolic blood pressure is below 100 mm the patient has hypotension.

What distinguishes these investigations from what are described as 'special investigations' is, as far as one can tell, the fact that the above are performed in

the clinician's rooms whereas the special tests are undertaken elsewhere - e.g. in the radiology department, laboratory or operating theatre.

SPECIAL EXAMINATIONS AND INVESTIGATIONS

The main classes of special investigations are endoscopy, radiology and examination of body fluids (including blood) and tissue samples. Others include investigation by ultrasound and radio-active isotopes.

Endoscopies

The body has openings to the exterior enabling instruments to be passed along these passages for inspection of the organs to which they lead. Thus, instruments can be passed down the gullet into the stomach and through the stomach into the duodenum and the upper part of the small intestine. Similarly examination of the interior of the bladder can be conducted by passage of instruments through the urethra, and the large intestine can be inspected by instruments passed through the anus and rectum.

Occasionally, endoscopies are performed which involve making an incision to gain access to body cavities. The best known of these is laparoscopy, which is mainly used for gynaecological diagnosis and operative treatment (See also laparoscopic sterilisation of women, Chapter 17). Less common is mediastinoscopy.

Table of Endoscopies

| <u>Investigation</u> | <u>Organ examined</u> |
|----------------------|-----------------------|
|----------------------|-----------------------|

| | |
|--------------|---------|
| bronchoscopy | bronchi |
|--------------|---------|

| | |
|-------------|-------|
| colonoscopy | colon |
|-------------|-------|

| | |
|------------|---------------------------|
| colposcopy | vagina and uterine cervix |
|------------|---------------------------|

| | |
|------------|-----------------|
| cystoscopy | urinary bladder |
|------------|-----------------|

| | |
|--------------------|----------------------|
| gastroduodenoscopy | stomach and duodenum |
|--------------------|----------------------|

| | |
|-------------|--|
| Laparoscopy | abdominal contents particularly internal female genitalia. |
|-------------|--|

| | |
|--------------|--------|
| laryngoscopy | larynx |
|--------------|--------|

| | |
|-----------------|--------------------------------------|
| mediastinoscopy | mediastinum (area between the lungs) |
|-----------------|--------------------------------------|

| | |
|----------------|---------------------|
| oesophagoscopy | oesophagus (gullet) |
|----------------|---------------------|

proctoscopy anus and rectum

sigmoidoscopy sigmoid colon. (Only the modern flexible instruments reach the colon; the others are really proctoscopes.)

thoracoscopy pleural surface of the lungs

By and large the instruments can be passed with little risk to the patient provided the examinations are performed skillfully.

Mishaps during Endoscopy

Endoscopies are not without risk as perforation of the walls of the organs examined or organs through which the instruments have to pass in order to reach the site of examination can occur. This arises either because the instruments are passed with undue force or because the organs examined are easily torn because of the nature of the disease, or have some structural abnormality (e.g. an outpouching in which the tip of the instrument is arrested) which renders them susceptible to endoscopic injury.

Whenever such perforation occurs, there is a prima facie case of negligence. But each case must be investigated and determined on its merits. If the tissues were unduly softened by disease (or are the subject of some other abnormality) which could not reasonably have been anticipated, perforation may not be an indication of negligence (see cystoscopy in Chapter 11).

Case 41

A middle-aged woman was admitted to hospital in 1955 for investigation of ulcer symptoms. Flexible gastroscopes were not then available. During the examination the oesophagus was perforated. Following this, she became very ill over a weekend, but the junior hospital staff failed to notify the consultant until she was moribund. No claim eventuated. Had one been lodged it would have been indefensible.

Case 42

An elderly man suffering from carcinoma of the upper end of the stomach involving the lower oesophagus was admitted to hospital for passage of a tube through the tumour constriction via an oesophagoscope. During this procedure the lower oesophagus or the upper end of the stomach was perforated. Emergency surgery followed with an excellent result.

Comment Perforation was a hazard of the procedure. The complication was quickly and well managed. There was no negligence. [See also Chapter 11]

Radiological examinations

Most cases involving negligence claims in connection with radiological examinations fall into four categories:

- . Failure to order an appropriate X-ray Thus X-rays of the femur (thigh bone) may have been ordered and displayed a fracture in that bone, but as no X-ray was taken of the adjoining hip joint, its dislocation was missed (see also Chapter 12).
- . Incorrect interpretation of films by the radiologist or other examining doctor.
- . Ignoring the radiologist's report.
- . Placing undue reliance on X-ray reports

Many such cases will be studied in various chapters. Below are mentioned a special set of cases not dealt with elsewhere in this book.

Injury During Radiological Examination

As a rule radiological examination does not physically harm the patient. The amount of radiation is carefully controlled and accidents are rare. Also rare are accidental electrocutions from contact with exposed high power electrical conductors. Injury can, however, occur during invasive radiological examination. Most of the serious injuries arise from angiography and therapeutic arterial embolisation.

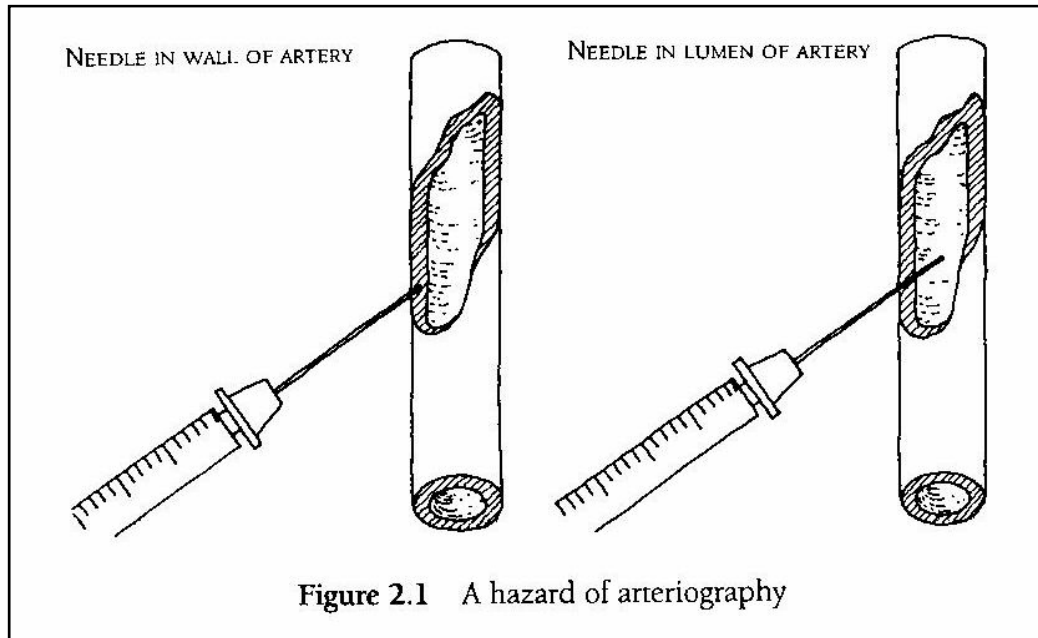
Angiography

During these investigations, radio-opaque dyes are injected into the lumen of the blood vessel (mostly an artery) and as the injection proceeds, a series of films is taken. In this way the blood vessels themselves are outlined, showing narrowing or blockage due to disease, abnormal communications with other vessels (e.g. arterio-venous fistulae) and abnormal dilatations (aneurysms). Also demonstrated are abnormal circulations indicative of disease in the organ being examined. There have been reports of damage to kidneys, the spinal cord and the brain.

Case 43

A man complained of headaches. It was decided to perform a carotid angiogram. When this investigation was performed, CT scans were not available, and at that time, the dye was injected directly into the carotid artery. Unfortunately, the dye was injected into the

wall of the artery instead of the lumen, 'stripping up' the lining endothelium and blocking the artery [see explanatory diagram below]. The patient died of a massive stroke.



Comment Although this was a hazard of the procedure, and alternative techniques were then not available, close investigation of what precisely was done at the time is necessary. Thus, what steps did the surgeon or radiologist take to ensure that he was in the artery rather than in its wall? Today, the dye is injected via a catheter inserted into the femoral artery, and this complication has become a thing of the past. The main hazard of carotid arteriography today is dislodging an atheromatous plaque in the wall of the artery. If this lodges in an important area of the brain, severe disability can result. This is an uncommon event, and mishaps can rarely be attributed to negligence.

But errors in technique can have disastrous sequelae as the following cases indicate, and they cannot always be attributed to bad luck.

Case 44 MDU

A 22 year-old lady with a past history of juvenile myxoedema began to suffer from chest pains on exertion and consulted her general practitioner. He referred her to a cardiologist who asked a colleague to undertake coronary arteriography.

Shortly after the initial injection into the right brachial artery, severe arterial spasm developed proximal to the injection site. Later the artery became pulseless and treatment with intravenous heparin was started. The radial pulse did not return and the hand remained cool. Next day thrombus proximal and distal to the arteriotomy was removed by Fogarty catheter, but the pulse did not return. Further exploration and repair of the radial artery failed to restore the pulse but the hand became warm. No further investigation was undertaken at that time and the patient was discharged a few days later.

As a result of these complications the patient, who was a promising cellist, has been unable to pursue her chosen career. She can only use her hand for short periods of time before developing cramp in the forearm; thereafter the hand becomes so weak that it is useless. She can now play the cello for only a minute or two and is therefore unable to perform professionally.

Over two years after the investigations, solicitors served a writ and statement of claim on her behalf. The Union's expert advisers felt that the case would be difficult to defend, especially as the patient was not given a follow-up appointment. The case was settled out of court.

Case 45 MDU

A 39 year-old man was referred for selective renal angiography to diagnose the cause of his hypertension. On recovery from the anaesthetic he was found to have paraplegia. The patient claimed that the doctor had been negligent because the contrast medium was over-concentrated and in excessive dosage.

The Union's experts advised that while the contrast medium was satisfactory for the aortography and identification of the renal arteries, it was too concentrated for renal angiography and that this was probably unnecessary in view of the quality of the initial aortic X-rays.

The paraplegia was ascribed to chemical myelitis and the claim was settled plus costs.

Case 46 MDU

A 57 year-old man was admitted to hospital in 1968 following recurrent episodes of blurred vision which were thought to be due to embolism in a carotid artery. An aortic arch angiogram was carried out by an experienced senior registrar in radiology. In accordance with the usual practice, he first attempted a femoral puncture but this proved impossible because of local atheroma. Successful catheterisation was carried out via the axillary artery. When a test injection was made to check the position of the catheter, the patient complained of pain at the puncture site. Radiographic appearances were satisfactory, the investigation was completed and the catheter was withdrawn. The angiogram demonstrated that there was atheromatous irregularity of the internal carotid wall, which it was thought might be the source of the emboli. That evening the patient had weakness of the hand muscles with impairment of sensation in the ring and little fingers. The muscular weakness slowly improved. The cause of the trouble appeared to be a lesion affecting the brachial plexus with involvement of the muscles innervated by the median and ulnar nerves. These sequelae of arch angiograms are recorded in the literature.

In 1971 solicitors alleged that the patient had almost total paralysis of the small muscles of the right hand, weakness of the biceps and flexor carpi ulnaris and loss of sensation in the hand and part of the forearm. He was said to have intended to supplement his income

after retirement by piano playing. Expert opinion was that the patient would improve slowly; there was nothing to suggest that the member had been negligent in carrying out the angiogram. The case came to the High Court in 1974 and it was necessary for the member, now a consultant overseas, to fly back for the trial. The additional cost was met by the Union to enable the case to be properly defended. No radiologist was called to give evidence on the plaintiff's behalf. The claim by the patient was dismissed after a trial lasting a week, the judge complimenting the radiologist on his skills and on his evidence. Neither the hospital board nor the Union were able to recover costs from the patient who was legally aided.

Comment It is uncertain whether a similar episode today would end in favour of the defendants.

Therapeutic Arterial Embolisation

An interesting medico-legal case involving interventional radiology is reported in the British Medical Journal 1986: Vol 293; 686-687.

Case 47

A boy aged seven was treated for a haemangioma (a red swelling caused by malformation of blood vessels) of the lip by embolisation (plugging up) of the external carotid artery with tiny pieces of gel foam. The gel foam, however, also embolised the middle cerebral artery causing severe brain damage and death.

The General Medical Council suspended the two radiologists involved for six months for serious professional misconduct.

The parents had been told that there was a 1% risk in the procedure. Professor David Allison, the GMC's expert witness, told the committee: 'If you give a patient with a lesion of the face, which is only causing a cosmetic problem, a stroke, that is a risk which is out of all proportion to the apparent numerical magnitude of the risk when one expresses a risk of one per cent.'

Comment One could add that laser treatment is available for these haemangiomas. This carries only the risk of scarring. Small haemangiomas can be excised.

Barium enemas can also cause damage. A case is outlined in Chapter 11.

Radiological Manipulation

Risks are incurred by radiologists undertaking other forms of interventional investigations cum treatment. One of these involves removing stones from the common bile duct through T tube tracks, when stones have been overlooked by the surgeon.

Case 48

An elderly woman had her gall bladder with contained stones removed. Numerous calculi lying in the common bile duct were also removed. Unfortunately, many stones remained in the widely dilated left hepatic ducts; indeed, they were full of stones. After operation, a radiologist attempted multiple removal of stones through the T tube track but in the end, the manipulations resulted in a tight common bile duct stricture which the radiologist then attempted to dilate. Further very complex surgery, which was highly successful followed.

Comment The correct treatment *ab initio* was removal of the left hepatic lobe in addition to the gall bladder and the duct stones. As it was impossible to cure the patient without this procedure, there was no indication for radiological interference. Moreover, it is impossible successfully to treat bile duct strictures by dilatation. No claim ensued.

Mammography

In recent years soft tissue radiology of the breast has improved and detection of small breast tumours is now possible. Controversy surrounds its use as a means of early diagnosis of breast cancer by mass screening. Unfortunately, cancers are not always shown on X-ray films, and practitioners not aware of this trap can unwisely re-assure patients that the lump which they can feel is not cancerous.

Alleging that delay in diagnosis of a particular patient's breast cancer rendered a potentially curable breast cancer into an incurable one is fraught with difficulty if rigid scientific criteria are applied. Cancers which grow rapidly enough to become the cause of the woman's death spread, almost always, through the bloodstream before they can be detected by mammography. Nonetheless courts regularly award damages to patients for delayed diagnosis.

The author is not keen to support such claims unless they denied the patient the opportunity to have local resection of the tumour – that is the cancer had grown so large that only total mastectomy or radiotherapy was available to treat it. The author recognizes that his opinion is not shared by many experts. Patients treated for breast cancer whose lymph nodes are not clinically affected, show no correlation between the size of the tumour and life expectancy. This is disputed by enthusiasts of breast screening but the issue is clouded by analyses of statistics and the uncertainty of the diagnoses - it is unclear whether many cures claimed for screening programs arise from the inclusion in the "cures" cases which were not malignant at all or which were so slow-growing that they would not have affected the outcome. As the years go by, the 'stage' reached by the disease at the time of treatment becomes less and less important in determining the length of survival. At ten years after treatment patients treated for breast cancer have a prognosis hardly dependent at all on whether they were stage 1 or

stage 2 at the time of treatment provided histopathology confirms a diagnosis of malignancy.

LABORATORY TESTS

Inadequacy of care may be alleged because appropriate tests were not ordered or, having been ordered, were misinterpreted or ignored. Finally, some laboratories are lax, and the results published are wrong.

An enormous number of tests is now available. Samples of blood, urine, faeces, sputum, skin scrapings, hair clippings and best of all, pieces of tissue (biopsies) can be examined in a variety of ways. The function of various organs can also be examined by interpreting recordings of the minute electrical impulses generated by them. It is not possible to give details of all those available and the reader is referred to suitable texts giving tables. One example (tests for diabetes) is given and others will arise here and there throughout the book.

Biochemical investigations

Many biochemical investigations are used in clinical medicine to monitor treatment, particularly intravenous therapy (q.v.), but a large number are diagnostic of disease.

Diabetes

Diabetes mellitus is a condition in which there is insufficient insulin available for the body's use. The result is that carbohydrate metabolism is disturbed with accumulation of glucose and ketones in the bloodstream, leading if untreated, in turn, to hyperglycaemia, diabetic acidosis, pre-coma, coma and death. Death and serious brain damage through hypoglycaemic coma can be caused by giving a patient insulin without simultaneously, an adequate supply of carbohydrate.

The determination of blood and urine levels of glucose in the investigation of diabetes mellitus is used as an example. A highly elevated blood sugar after four hours of starvation is diagnostic of diabetes; finding glucose in the urine is not diagnostic of diabetes but it must lead the clinician to make sure that the patient is not diabetic. Failure to carry out blood glucose testing has caused much unnecessary morbidity and many deaths.

In an 18 month period, 60 cases involving diabetes were reported to the Medical Defence Union; the commonest complaints were failure to diagnose the condition initially. That inadequacy generally arose from very simple failures, e.g. not testing the urine, failing to order a blood test. The consequences can be lethal.

Below are two examples.

Case 49 MDU

A typical case involved a general practitioner who was consulted by a boy of 16 complaining of lethargy and weight loss. The practitioner found the tongue bright red and the breath sweet, the result of drinking a large quantity of cherryade. He took blood for various tests but failed to test the urine, and was horrified to hear 48 hours later that the patient had been found dead. It was subsequently reported that the blood glucose was 50.8 m.mol/L. A claim followed which was settled.

Case 50 MDU

Following an inquest at which a verdict of death by natural causes was returned, solicitors wrote to a general practitioner member indicating a claim for negligence arising out of an alleged delay in diagnosing diabetes. The 23 year-old patient was first seen at home complaining of a sore throat and vomiting. The weather was hot and a history of increased drinking was thought unremarkable, but evidence was given later that the excessive drinking amounted to 96 bottles of 'pop' in five days. The patient had also developed renal pain which further complicated the diagnosis. He was sent to hospital 15 days after the onset of the illness. The blood sugar level was estimated and found to be 71 m.mol/L. The patient had a cardiac arrest and died.

Experts advised that although the important delay occurred after admission to hospital, the General Practitioner could not escape criticism for keeping the patient at home for more than two weeks. When the claim was settled the Union contributed one third on behalf of the member.

Case 50.1

A known diabetic aged 42, who believed his condition was controlled by dieting alone, was admitted to hospital for spinal surgery. His glucose levels were not monitored and he lapsed into pre-coma. The spinal surgery wound became infected. The claim was settled.

Comment Diabetics who rely on diet to control their condition will develop hyperglycaemia after trauma, and need to be monitored.

HISTOPATHOLOGY

When a biopsy is taken, the resulting tiny piece is sent, usually in toto, to the histopathology laboratory. Occasionally some portions of it will be sent for other examinations (e.g. for bacterial culture). The specimen sent to the histopathologist is first 'fixed' with formalin, then dried out with increasingly pure alcohol and eventually impregnated with paraffin. From the resulting block which contains the specimen embedded in it, very fine 'paraffin sections' are cut. The

paraffin is then dissolved out leaving an extremely thin piece of tissue on the microscope slide. This is stained with a variety of dyes and examined under the microscope. The histopathologist will issue a written report based upon his interpretation of the microscopic findings. A high degree of accuracy is attainable from the examination of paraffin sections and consequently much reliance is placed on these reports. Errors can have disastrous consequences.

Frozen Section reports are those based on an examination of tissues frozen immediately after removal from the patient. The results are not as reliable as those obtained by paraffin sections. When in doubt the pathologist must notify the surgeon that it will require paraffin sections to be examined before a diagnosis can be made.

Case 51 MDU

An experienced senior registrar in histopathology examined a frozen section of a breast biopsy from a woman aged forty seven. His initial opinion was that it showed anaplastic carcinoma and a registrar colleague agreed. The result was telephoned to the surgical Senior House Officer who expressed surprise. For this reason the senior registrar in pathology looked again at the slide and became doubtful. Another pathology registrar thought that the specimen was a lymph node. The senior registrar telephoned the surgical team again and the operation was stopped but not before the incision for mastectomy had been made. It was decided to wait for paraffin sections, and these confirmed that the specimen was a normal lymph node. The patient instructed solicitors to claim on account of the unnecessary scar. A plastic surgeon was asked to examine her and an expert histopathologist reviewed the slides. The pathologist, who pointed out that he had the advantage of seeing paraffin sections, indicated that there were certain features which gave rise to difficulty which would have been exaggerated in frozen material. It was accepted that a mistake had been made and whilst the expert felt that this was an understandable one, the patient had an unpleasant scar. The Council of the Union decided that an ex gratia payment should be made to the patient.

Comment If there is any doubt about the diagnosis in such circumstances, the pathologist should report that the finding is unclear and advise the surgeon that a definitive diagnosis cannot be made until paraffin sections are available. There is no evidence that waiting a few days before proceeding to mastectomy adversely affects the outcome.

Case 52

A woman attended with a curious swelling of the forearm. After its removal, the pathologist made a diagnosis of sarcoma. The patient was referred for radiotherapy. Half way through the course of treatment a report from a more experienced pathologist to whom the first pathologist had referred the slides was obtained. The tumour was benign. Radiotherapy was stopped.

Comment No claim ensued. If it had, the question would have turned on whether the diagnosis was very difficult and the error reasonable. The pathologist wisely had taken the precaution of obtaining a second opinion.

Punch Biopsies

A large bore hollow steel needle is inserted into the tissue to be examined. The resulting specimen within the needle is prepared as a paraffin section. The result gives a high degree of accuracy provided (a) the needle penetrates the lump being investigated and (b) a useful specimen is obtained. It is the possibility of missing the essential part of the swelling that makes this method of investigation inferior to open (standard surgical) biopsy. The advantage of punch biopsy is that it can often be performed as an outpatient procedure, and usually produces a virtually invisible scar. If malignancy is suspected, but the punch biopsy report is 'benign', open biopsy may be advisable.

Case 53

A woman presented with a breast lump. Punch biopsy was undertaken and the pathologist reported benign mammary hyperplasia. Some months later an open biopsy was performed, revealing a carcinoma of the breast. No claim ensued.

Needle Aspiration Cytology

Needle aspiration cytology is less accurate. In this investigation, a fine needle connected to a syringe is inserted into a swelling and the plunger pulled back so that some cells and liquid are sucked back into the syringe. This material is squirted onto a microscope slide. In turn the cells on the slide are stained and examined under the microscope. Diagnosis must be made on the appearance of individual cells and a high degree of diagnostic accuracy is not always achieved. Reports often read: cells seen are somewhat suspicious of carcinoma.

Although some cytologists have achieved a very high level of accuracy in diagnosis, this skill is not universally available. In the personal view of the author aspiration cytology reports should not be relied upon where major procedures are contemplated, purely on the basis of their evidence; other clinicians place greater reliance on needle aspiration. Nor can a negative result be taken to indicate that no tumour is present; quite apart from anything else, the dangers inherent in punch biopsies (see above) are even greater in this needle aspiration. The results are a guide only. The same applies to cytology obtained from cervical swabs in women.

Case 54 MDU

A 26 year-old woman developed a breast lump and underwent a needle biopsy. The specimen was seen by a histopathologist who reported the presence of large numbers of

malignant cells. A mastectomy was performed but no malignancy was found in the breast specimen. Review of the biopsy showed a simple fibroadenoma with some atypical features. The histopathologist admitted that the original biopsy specimen had been misinterpreted and since no frozen section had been done the mistake was not noticed until the breast itself was examined post-operatively. The surgeon reported that the naked-eye appearance was highly suggestive of malignancy. The case was settled.

Comment This case illustrates how unwise it is to use needle aspiration biopsy as a definitive test for malignancy. If a frozen section biopsy had been undertaken, this error would almost certainly have been avoided.

Bacteriological Investigations

Investigation of specimens for micro-organisms is undertaken in two ways.

A drop of the liquid is placed on a microscope slide and spread across to form a thin layer (if the specimen is solid, its surface is smeared across the slide). The resulting film is stained with appropriate dyes and examined microscopically.

The material is inoculated into a suitable culture medium. Each organism grows best on particular media. Sometimes (particularly with viruses) a living organism is necessary to grow the organism.

Precise identification of the type of the organism is often not possible without culture of the organism. Sometimes other tests are also required.

Care must be taken in interpreting the results.

Case 55 MDU

A member in general practice in Canada was consulted by a 50 year-old woman complaining of vaginal discharge, which appeared to be due to a trichomonal infection. The patient was examined and a swab was taken. Four days later the member received a report that no trichomonas or yeast cells had been detected and that numerous intracellular and extracellular gram-negative diplococci were present. He recalled the patient and told her that the report indicated that she had gonorrhoea. He arranged for serum tests and prescribed penicillin. It was explained to her that gonorrhoea was a notifiable disease and that the medical officer of health would send a nurse to identify and trace the contacts. When the patient returned she was accompanied by her irate husband, who disputed the diagnosis. The member then telephoned the bacteriologist in charge of the laboratory, who pointed out that other bacteria can resemble gram-negative diplococci, for example dead staphylococci, but that technicians were well aware of these pitfalls and did not lightly report the presence of *Neisseria gonorrhoeae*. The only irrefutable evidence of the causative organism of gonorrhoea was the culture of the organism. The member conveyed this view to the couple and suggested that

investigations be repeated. Fresh swabs were taken and blood tests were arranged. All laboratory tests proved negative for venereal disease and the couple was informed of the results of the latest tests. They immediately lodged a formal complaint with the College of Physicians and Surgeons alleging unprofessional conduct on the part of the member. He was asked for his observations by the College and he then consulted the solicitors' agents; a report was prepared and submitted on his behalf. The College dismissed the complaint.

Comment The husband was right to be irate; but the doctor did his best to correct the error, and no permanent harm came of it. The couple and the doctor should have been able to sort things out without recourse to formal complaints.

FAILURE TO DIAGNOSE

Failure to diagnose infection

As a rule, the fact that an acute infection exists will be correctly diagnosed; the presence of an elevated temperature will generally lead to that. The usual mistake in the diagnosis of acute infections is that the type of infection is missed. This has been the case particularly since the introduction of antibiotics which has led to the use of these drugs as a treatment for fever, i.e. as a mechanical response to that symptom instead of looking for a diagnosis first. If the appropriate agent happens to be given, no harm results. But if not, the result can be lethal. We have already studied cases of missed diagnosis in acute infection (e.g. malaria) in earlier sections of this chapter. We now examine the problem presented by chronic (slowly developing) infections.

Failure to diagnose chronic infections

It is much more difficult to make a correct diagnosis of tuberculosis and other chronic infections than it is to diagnose an acute infection, since their onset is usually insidious and the symptoms can resemble those caused by other conditions. Furthermore, in 'Western' countries, TB is now quite rare except in migrants. Leprosy (Hansen's disease) is also frequently diagnosed late in non-endemic areas. Below are a number of examples of failure to diagnose tuberculosis.

Case 56 MDU

A 27 year-old man with back pain was referred by his General Practitioner to a physician who noted reduced spinal flexion and a possible disc lesion at L1/2. He recorded:

'TB is high on the list...Impression: back pain for investigation, query tuberculosis.' A radiologist member of another society reported no significant abnormality on the X-rays, though they showed a destroyed disc and probable vertebral body destruction. A penetrating duodenal ulcer was considered and a barium meal was arranged as an

outpatient. The negative report of this investigation was filed and not communicated to the physician. A week later, following a domiciliary visit, the physician re-admitted the patient because of his continuing back pain. There were no neurological signs in the legs but the ESR was 40 mm per hour. Lumbar puncture suggested spinal blockage and a neurosurgeon diagnosed sub-acute spinal compression and arranged for transfer to the neurological unit. At this stage the patient had weakness in his legs, but was walking quite well and had lost his backache. Within 24 hours of the transfer he developed marked loss of power in both legs and retention of urine. A myelogram showed a complete spinal block at D8/9 level with narrowing of the D7/8 disc space. Exploration revealed a tuberculous intraspinal abscess. Post-operatively complete paraplegia developed, but there was no sensory loss or retention of urine. The patient made a slow but almost complete recovery. His claim of negligence and delayed diagnosis went to trial and he was awarded a sum of which the health authority bore fifty percent. Comment Had the diagnosis not been delayed, there would have been a good chance that paraplegia (paralysis of both legs) would have been avoided altogether.

Case 57 MDU

In 1950 a man aged 19 was treated for disseminated tuberculosis with a lesion in each wrist and in one epididymis. Nearly 16 years later, in 1966, he developed epididymo-orchitis and was treated by his general practitioner with antibiotics, without improvement. The patient complained of tiredness and a short dry cough, associated with a fever of 103 degrees F [39.4 degrees C]. The inflamed mass which included testicle and epididymis eventually discharged pus. The patient began to lose weight and was treated with Vitamin C and iron tablets. He became lethargic and irritable and developed neurological signs. Two months after his epididymo-orchitis had developed, he was admitted to hospital with miliary tuberculosis and tuberculous meningitis. When he was discharged from hospital nearly four months later he was completely dependent on his wife to nurse him, blind in one eye and with little vision in the other. A claim was made against the general practitioners in 1973 and, despite the time which had elapsed, it was possible for the patient to proceed; the wife of the patient who had delayed taking legal action had been heavily committed in looking after her husband. Expert advice was that the diagnosis of tuberculosis could have been made at the time of the acute epididymo-orchitis in July 1966 or at least when he had failed to respond to antibiotics within a short time.

Case 58 MDU

A 35 year-old woman was admitted to hospital following a 36 hour asthmatic attack. She had a history of asthma and had attended the hospital chest clinic for four years. The registrar considered the chest X-ray to be normal. Her symptoms subsided and she was discharged after 48 hours before the film had been seen by the radiologist. In his report he noted shadowing at the right apex suggesting aspergillosis, but warned that tuberculosis and neoplasm could not be excluded. The woman was followed up in outpatients two weeks later, but the clinic was held at a different hospital where neither the radiograph nor the radiologist's report was available. As the X-ray report was not

referred to in the discharge summary sent to the general practitioner no action was taken upon it. The patient was admitted to another hospital two months later with haemoptysis, when pulmonary tuberculosis was diagnosed and treated. In a claim she alleged the tuberculosis should have been detected earlier and that because of the delay there had been avoidable damage to her lungs and treatment had been considerably prolonged. It was appreciated that the diagnosis of tuberculosis in a patient with asthma may be difficult, but in this case the woman had not received an appropriate standard of care. The hospital's records and filing system left much to be desired and it was on this basis that the damages were shared equally between the Union and the hospital.

Comment The delay does not seem to have caused much damage and the claim would most probably have been settled for a moderate sum. Not all cases of failed diagnosis for tuberculosis can be faulted in this way; it all depends on the circumstances as the following case shows.

Case 59 MDU

In 1973 solicitors served writs on two partners in general practice and on a hospital management committee hundreds of miles away. Against the partners they alleged negligent failure in 1967/68 to diagnose renal tuberculosis in their client, a teacher then in his thirties. Against the hospital management committee they alleged that a casualty officer employee had failed to deal adequately with an episode of haematuria while the patient was away from home attending a wedding. The delay in bringing proceedings resulted from the patient having attended a naturopath between 1968 and 1970 and only in January 1971 when he again consulted a doctor was renal tuberculosis diagnosed. By then the disease was so widespread that he had to undergo extensive surgery comprising a cutaneous ureterostomy, two-stage urethroplasty, reconstruction of the bladder and left ureter, pyeloplasty at the junction of the left renal pelvis and upper ureter, and removal of the right kidney and ureter.

In 1973 the Union and its solicitors began to assemble the facts of 1967-68. At that time the patient had been referred to a genito-urinary surgeon on account of urgency and increasing frequency of micturition. After full investigation including intravenous pyelography and cystoscopy the surgeon decided that the symptoms were due to a spastic bladder. In 1968 there were further symptoms including haematuria but the patient had been reluctant to return to the surgeon's clinic as his doctor recommended and had consulted a naturopath on whose advice he relied for two years. In 1974 one of the two partners in general practice was killed in an air accident. The case was considered by the Union's expert advisers. There was a conflict between the recollection of the surviving partner, supported by the notes of 1967-68 and that of the patient as to the number of consultations and the symptoms reported. Haematuria would not have been compatible with the surgeon's diagnosis of spastic bladder. In 1980 there was a three week trial in the High Court. The allegations against the casualty officer were not pursued. One of the Union's advisers on general practice attended throughout the trial and gave expert evidence for the defence. Giving judgment, the judge said: 'The records should be accepted as accurate...I do not find that either doctor failed....On disputed matters I

cannot prefer the plaintiff's evidence to Dr A's. Judgment was given for the defendants, but none of the Union's very substantial costs could be recovered.

Comment The patient's non return to the surgeon presumably went against him. There is nothing in these MDU notes which tells whether the urine was examined for TB bacilli.

Failure to diagnose cancer

Before turning to examples of missed diagnosis in this area, the non medical reader may wish to acquaint himself with some general features of the disease and its treatment. These are dealt with very briefly below.

Definition

Substantial experimental data now exist which clarify to some extent the processes involved in the causation of tumours. There now seems little doubt that abnormal cells arise and reproduce themselves because of an alteration in their genetic make up by alterations in the deoxyribonucleic acid (DNA). Despite a vast increase in knowledge which, in some areas, is sufficient to enable us to take measures to prevent the development of tumours, precise definitions of what constitute tumours (neoplasms) is not yet possible. Bearing these reservations in mind, the following is one of the many more or less acceptable definitions of a tumour.

A neoplasm is an abnormal collection of cells capable of autonomous growth.

This definition indicates the two essential features of tumours, namely that their cells or cell arrangement patterns are abnormal and that they do not 'obey' the normal body mechanisms regulating cell proliferation and distribution.

Classification and description

Tumours are classified in a number of ways for clinical purposes, and of these classifications the most fundamental is the distinction between benign and malignant growths.

Malignant tumours

Malignant tumours are those able to invade surrounding tissues including the lymphatic vessels and blood stream. Malignant cells may, by invading blood or lymphatic vessels, or by being carried across body cavities, become deposited within other parts of the body at a distance from the primary tumour; such secondary growths are called metastases. For example, a lung cancer frequently produces metastases in the brain. In most instances, the malignant nature of a tumour is easily determined both by the naked eye and

microscopically. Occasionally however, even after histological examination (microscopic examination of tissues) it may be impossible for a pathologist to express a confident opinion.

Malignant tumours (also called cancers) are further subdivided according to their cellular origin. If derived from epithelial cells (e.g. the skin, the lining of the stomach or other hollow organs) the tumour is called a **carcinoma**. Where a tumour arises from (non-epithelial) mesenchymal cells (e.g. fibrous or muscle tissue cells) it is called a **sarcoma**. Where it is unclear (or disputed) whether the tumour arises from either of these two groups of cellular elements, the terms are avoided and a non-committal one is substituted (e.g. malignant melanoma). In some carcinomatous growths, it is possible to recognise malignant change in epithelial cells before invasion occurs; this is carcinoma-in-situ. When discovered it presents an ideal therapeutic situation in which it is possible to obtain 100% cure of the affected subjects. The best known of these is carcinoma-in-situ of the uterine cervix. It is highly probable that most malignant growths go through a pre-invasive phase. Unfortunately, in most instances, this pre-malignant phase is unattended by symptoms which might alert the patient to the problem; and with the noted exception of carcinoma-in-situ of the uterine cervix, special investigations are not often as helpful in establishing the diagnosis at this early and curable stage as they are at later stages. A tumour closely resembling the tissue from which it originates is called highly differentiated. Such growths are frequently, but not invariably, less malignant than those at the opposite extreme of the spectrum, where the cellular pattern no longer has any resemblance to the tissue from which it originated. The latter are called undifferentiated, or anaplastic. Tumours are also described by their macroscopic and physical characteristics. Thus, a hard tumour is labelled scirrhus, and a soft one, encephaloid (brain-like).

Benign tumours

Benign tumours do not possess the essential attributes of malignancy, namely, invasion and metastasis. Benign neoplasms will continue to grow and may compress surrounding structures but they do not invade them. Any deleterious effects which they produce are the result of pressure (not invasion), occlusion of hollow viscera or the effects of hormones secreted by some of them. Most, but not all, benign tumours are surrounded by a capsule of connective tissue and sometimes by a false capsule formed by compression of surrounding structures. Other descriptive classifications. In addition to those given above, both benign and malignant tumours may acquire other descriptive titles. A tumour arising from glandular epithelium is frequently given the prefix adeno-; one arising from epithelium may be called an epithelioma; one from muscles is given the prefix myo-. Thus, we may speak of adenocarcinoma, epithelioma and myosarcoma. If the tumours lie flush against a surface they are described as sessile, and if on a stalk they are called pedunculated tumours or polyps. Thus a full description of

a particular gastric carcinoma might be as follows: a mucus secreting polypoidal adenocarcinoma of the stomach.

Benign tumours

Frequently, and particularly when they are small, benign tumours cause no symptoms. Uncomplicated benign tumours are almost invariably painless but they may bleed and discharge mucus. Occasionally pain may be produced by compression of nerve fibres, particularly within narrow spaces (e.g. a bony canal). Pressure exerted by the increasing size of the tumour may cause erosion of bone, obstruction of hollow tubes such as the trachea or in the case of the intestine, intussusception (telescoping of a portion of bowel into an adjoining segment) due to the tumour being pulled down (very rarely up) by intestinal motility. In some instances where the diagnosis is obvious (most commonly in the case of small subcutaneous lipomas), treatment may be required only for cosmetic reasons. In most instances, however, it is preferable to remove benign tumours in order to avoid complications and also because, in some cases, malignant transformation may occur. Medical treatment has no place in the curative treatment of benign tumours.

Malignant tumours

The clinical features of malignant tumours depend on many factors, in particular, the kind of tumour, the tissue in which it originates and whether or not there are metastases. Unless there are complications, pain is not a common initial symptom of malignancy, although it is frequent in the later stages of the disease. Common modes of presentation are alteration of normal function (e.g. an alteration of bowel habit), obstruction of hollow tubes (e.g. jaundice due to bile duct obstruction, occurring in a patient with carcinoma of the head of the pancreas), swellings (e.g. tumours of the thyroid gland and large tumours of abdominal organs), and by bleeding.

Tumours which have to do with the alimentary canal frequently interfere with proper nutrition and produce weight loss. The presenting symptom may be due to metastases. e.g. a patient may first become aware of a tumour of the kidney because he sustains a spontaneous fracture of a bone due to a metastasis. Although the above are common presenting symptoms, almost any symptom can be caused by cancer. It is thus abundantly clear that the manifestations of cancer are very varied, and in the initial phases, the symptoms can be very subtle indeed, and easily missed. Often the patient, afraid of the diagnosis, will hide his symptoms (see Case 36).

Failure to make an early diagnosis causes much distress, but such failure does not always mean that the patient would have been cured had an early diagnosis been made. This applies particularly with respect to breast cancer and many cancers of internal organs as in these, blood spread frequently occurs early.

Nonetheless unreasonable delay in making the diagnosis does not enhance the chance of survival and prolongation of life.

Case 60

A middle aged man complained of rectal bleeding and frequent passage of stools, symptoms which cried out for further investigation. The general practitioner re-assured the patient. Eventually the symptoms became so distressing that he requested referral to a gastro-enterologist who immediately diagnosed rectal cancer. Although the rectum was removed, the patient died within a year of diagnosis. No claim ensued, but it would have been indefensible.

DOES DIAGNOSTIC DELAY CAUSE HARM?

In the author's view, the answer to this question can be given only by examining each individual case. The blanket view that all delay causes harm is not as clear cut in the diagnosis of cancer as it certainly is for meningitis, when diagnostic delay can mean the difference between survival and death or permanent disablement

The essential 'ingredient' for a prima facie case alleging negligence in the Commonwealth countries, from the medical point of view, is obviously that the patient must have been curable at the time of initial presentation; or alternatively that significantly less extensive, less destructive surgery or other milder forms of therapy would have been available had the treatment taken place earlier. If neither of these features obtains, the patient cannot, in the author's view, have a legitimate claim except for anxiety or other mental disturbance induced by the delay, and through not being believed. Having determined this we need to study what harm delay can cause.

We shall look at two extreme types of cases to illustrate the difficulty -- patients with highly malignant tumours, and those with very slow-growing ones.

Delay in diagnosing patients with highly malignant tumours.

First the delay must be significant; this usually means many months. Very few cancers spread 'like wildfire' in their destruction of the body. Those which do are rarely curable. Many malignant tumours metastasise early in their course; common examples are cancers of the lung and the pancreas. There are very few five year survivors among sufferers from these two conditions, and it is doubtful whether early diagnosis makes any significant difference to the outcome in the vast majority of cases.

In the rare cases where a highly malignant tumour turns out to be curable it is usually because it responds to cytotoxic agents [chemotherapy]. Again, diagnostic delay is then not very significant, since *'spread beyond the area of*

treatment' is not the factor it is when surgery and radiotherapy are the primary modes of treatment.

Hence, if this approach is accepted by the court, one of the strongest defences to an action for negligence when a diagnosis of a highly malignant cancer has been missed is that the delay did not influence the outcome to a significant extent; the issue was decided by the aggressiveness of the tumour rather than the size of the primary growth.

Case 61

A middle aged woman complained of increasing lassitude and weight loss. Initial investigation revealed an iron deficiency anaemia which was treated with iron tablets and a special diet. Many months later, a diagnosis of colon cancer was made. By this time the tumour had spread massively to the liver and operation would have been futile. There was no claim.

Comment Had a writ been issued it is doubtful it could have been proved that delay led to death whereas early diagnosis would, on the balance of probabilities have saved the patient's life; certainly early diagnosis would have enhanced the chance of cure. However, failure to find the cause of the anaemia before treating it is not an acceptable standard of practice. Indeed, failure to diagnose before treating a patient with anaemia is something the dangers of which are drummed into medical students again and again during their courses.

The following case illustrates how difficult it can be to sustain a claim of negligence in a patient with a highly malignant tumour.

Case 62 MDU

In New Zealand the Medical Practitioners' Disciplinary Committee has authority not only to hear complaints relating to a practitioner's behaviour but also to investigate the standards of medical practice. A general practitioner was charged with failure to diagnose a [patient with] thyroid carcinoma. The 49 year-old patient was first seen in 1977 with an asymptomatic lump in her neck. It was smooth, soft, cystic, half an inch in diameter and in the region of the left lobe of the thyroid gland. Thyroid function tests, full blood count and ESR were normal. Over the next four years the patient was seen seven times by the member without reference to the lesion. In August 1982 the patient noticed that her lump had enlarged considerably during the previous weeks and she was immediately referred for specialist opinion. Surgery revealed an undifferentiated giant cell carcinoma and despite chemotherapy and radiotherapy, her condition rapidly deteriorated. The patient's husband complained to the Disciplinary Committee that there had been a delay in diagnosis and the Committee elected to hold a full inquiry. The Union assisted the member and countered the criticisms of his management. The Committee concluded that the carcinoma had been of late onset, with rapid development

and could not have been diagnosed earlier. Accordingly the charge of professional misconduct was not sustained.

Comment Nonetheless the Courts often lean towards compensating patients whose diagnoses of cancer are delayed, and many patients have been awarded substantial sums

Delay in diagnosing patients with slow-growing tumours

We have seen that in the case of highly malignant tumours which do not respond to surgery and radiotherapy, delay may make very little difference to the outcome because of the early spread of the tumours to other tissues and organs. It is otherwise with tumours which do not spread from the originating site e.g. basal cell carcinoma (BCC) of the skin. In these cases, neglecting a tumour may mean that it will have eroded locally into tissues which would otherwise have been spared, e.g. failure to diagnose a BCC of the skin of the inner angle of the eye may lead to the necessity for extensive surgery, and in the worst cases, removal of the eye, when early recognition could have meant a simple removal of the small tumour. In such cases, claims for negligence would almost certainly succeed. In short, the more malignant the tumour, the more difficult it is to prove that delayed diagnosis led to earlier death or other physical damage. This is not to be taken that delay in diagnosis is deemed to be a good thing: quite the contrary.
