WEDNESDAY 7th JULY 1999

09.00–11.00 **PLENARY SESSION 7** (Corn Exchange)

MOCK TRIAL
Chairman: Mr A. Morrison (UK)

The legal system.

A. Morrison, Christina Milne
'Dyers', Marden Ash, Chipping Ongar, Essex CM5 9BT, UK. Fax: 01277-365931,e-mail: a.morrison@which.net

The legal system in the UK provides, in the civil courts, a remedy for patients ('Plaintiffs') to claim proof they have been victims of medical negligence. The test of negligence is whether other reasonably competent doctors would have done as the Defendant did (the Bolam test).

The Plaintiff's remedy is damages, calculated with reference to previous cases.

The courts, in which a judge sits without a jury, allow Plaintiff and Defendant to present oral factual evidence from involved witnesses, and expert evidence from independent doctors who have formed opinion as to the appropriateness of the clinical management.

Before a case reaches court, the parties exchange the substance of their factual and expert evidence, in statements and reports, thus giving each other notice of the strengths and weaknesses of their case. Many cases are settled after exchange, the others proceed to trial. The majority of negligence cases are funded by the legal aid system which requires limited, if any, contribution from the Plaintiff.

At trial the doctor whose treatment is alleged to have been negligent will normally give oral evidence, as will the witnesses and medical experts. Sometimes statements are accepted by both parties. The Plaintiff's case is heard first, followed by the Defence. Barristers represent the parties examining their own witnesses in chief and cross-examining the other party's witnesses. The purpose of cross-examination is to undermine the consistency and credibility of a witness. Barristers hope to satisfy the judge that the expert opinion has no logical scientific basis.

09.00–11.00 **PLENARY SESSION 8** (St John's College)

DISEASES OF THE THYROID GLAND – DEVELOPMENTS AND CONTROVERSIES
Chairman: Mr. J. Hibbert (UK), Dr Susan Clarke (UK)

Imaging of the thyroid gland.

C. A. Hoefnagel
Department of Nuclear Medicine, The Netherlands Cancer Institute, Plesmanlaan 121, 1066 CX Amsterdam, NL. Fax: 31 20 512 2290. e-mail: hoef@nki.nl

Apart from imaging the thyroid gland as an organ procedure for benign thyroid disease, nuclear medicine utilizes a variety of tumour-seeking tracers to detect malignant thyroid tumours and/or their metastases.

Benign thyroid disease: ^{99m}Tc-pertechnetate or ^{123}I-iodide are used to establish the type of hyperthyroidism, the nature of nodules and goitres, to demonstrate hypothyroidism and thyroiditis. Occasionally ^{201}T1-chloride may assist to show the thyroid gland in case of an autonomous nodule and ^{67}Ga-citrate in the diagnosis of thyroiditis.

Differentiated thyroid carcinoma: A ^{99m}Tc or ^{123}I-cold nodule may be analysed further by cytology, ultrasound/CT or ^{201}T1-imaging: a ^{99m}Tc/^{123}I-cold but ^{201}T1-hot nodule is highly suggestive for a malignancy. After total thyroidectomy, prior to ^{131}I ablation therapy, ^{131}I- or ^{123}I scintigraphy often reveals remnant thyroid tissue. The administered dose of ^{131}I is under debate with respect to the potential 'stunning' effect. Follow up relies on thyroglobulin assays, supplemented by total body imaging using ^{201} T1-chloride, ^{99m}Tc-sestamibi and ^{131}I-iodide. The latter demonstrates the ^{131}I-avidity of the tumour and can subsequently be used for treatment. PET tracers used for thyroid carcinoma are ^{124}I and ^{18}F-fluorodeoxyglucose.

Anaplastic carcinomas and lymphoma: ^{67}Ga-citrate scintigraphy is used for dedifferentiating and anaplastic carcinomas, as well as for lymphoma of the thyroid.

Medullary thyroid carcinoma: For MTC, which can not be imaged nor treated with ^{131}I as iodide, a number of tumour-seeking radiopharmaceuticals prevail, such as: ^{201}T1-chloride and ^{99m}Tc pentavalent DMSA (sensitivity 80 per cent, but nonspecific), ^{111}In octreotide (sensitivity 66 per cent and little specific), radiolabelled monoclonal antibodies or fragments against CEA or calcitonin (sensitivity around 60 per cent, but highly specific) and ^{123}I/^{131}I-MIBG (sensitivity only 33 per cent, but highly specific for neural crest tumours and also used to demonstrate phaeochromocytoma in MEN-2 syndromes). MTC metastases may be treated with ^{131}I-MIBG or bispecific anti-CEA/anti-DTPA monoclonal antibodies and ^{131}I-hapten.

Fine needle aspiration cytology.
P. Wilson

The surgical management of differentiated thyroid cancer.

J. C. Watkinson
Queen Elizabeth Hospital, Edgbaston, Birmingham B15 2TH, UK.

Approximately eight per cent of the UK population have nodular thyroid disease and half of these are solitary. Thyroid nodules are more common in women and increase with age. While thyroid nodules are common, thyroid cancer is uncommon in the UK with an incidence of four per 100,000.

The commonest way for thyroid cancer to present is as a solitary thyroid nodule in an euthyroid patient when the incidence of malignancy is approximately 10 per cent.

Thyroidectomy is usually indicated when a patient with a thyroid nodule has a reasonable chance of malignancy and there is considerable disagreement in the literature as to whether surgery should include 'less than total' or 'total' thyroidectomy. There are now a number of prognostic factors (age, gender, tumour size and histology, cervical and distant metastases, and incomplete surgical clearance) which allow division of both patients and tumours into high and low risk groups. This means that low risk patients with low risk tumours can be offered conservation surgery while the others usually require 'near total' or 'total' thyroidectomy.

Advanced disease requires anatomical imaging if surgery is indicated. High risk tumours in the thyroid are treated by total thyroidectomy and level 6 dissection. Palpable neck disease requires at least selective neck dissection (levels 2 to 5) and the mediastinum (level 7) should be assessed.

https://doi.org/10.1017/S0022215100158189 Published online by Cambridge University Press

Further disease should be treated on its merits but may require modified radical or radical neck dissection. In some cases, the presence of advanced disease invading local structures justifies radical surgery.

Twenty years experience of medullary carcinoma of the thyroid.

J. A. Lynn, A. Waghorn
Department of Surgery, Imperial College of Science, Technology and Medicine, Hammersmith Hospital, Ducane Road, London, W12 0HS, UK. Fax: 0171 460 5709

Medullary carcinoma of the thyroid is a rare tumour which occurs in both sporadic and hereditary forms. Twenty years experience of this tumour has shown that it presents in a variety of ways with the clinical behaviour ranging from aggressive to indolent. The main surgical management remains total thyroidectomy in both the sporadic and hereditary forms, with local neck dissection where necessary. In the familial forms, the detection and early management of phaeochromocytomas is paramount and our data shows that these are often multiple. Parathyroid tumours in the MEN 2A group of patients is usually mild, but may need either total or sub-total parathyroidectomy. The demonstration that the RET proto-oncogene is responsible for MEN type 2A, MEN type 2B, familial non-MEN MTC has revolutionized the management of these patients. Using genetic testing, we now operate on children as young as three years old and are consistently finding C-cell hyperplasia and even in early invasive disease in patients with allegedly normal calcitonin. The approach to medullary carcinoma in the future in the familial case will be directed by modern genetic techniques which will result in earlier diagnosis and a greater rate of cure.

External beam treatment for thyroid cancer.

C. Harmer, M. Bidmead, L. Vini, P. Rhys-Evans
Thyroid Unit, The Royal Marsden Hospital NHS Trust, London SW3 6JJ, UK. Fax: 0171 349 0786.

The well-differentiated papillary and follicular carcinomas are usually curable with surgery and radioactive iodine; external beam radiotherapy is required only for inoperable disease which does not concentrate ^{131}I. Surgery is also the definitive treatment for medullary carcinoma but these tumours do not have the ability to concentrate iodine, so that irradiation is more frequently required.

For anaplastic cancer, surgical resection is rarely possible because of advanced locoregional disease; response to chemotherapy is poor and therefore external beam treatment is invariably required. The majority of patients with primary thyroid lymphoma have early stage disease such that irradiation is again the dominant treatment. For sarcomas, definitive treatment with surgery is likely to result in a narrow margin of microscopic clearance and radiotherapy would normally be recommended in addition.

A mid-plane dose of 46 Gy given in 23 daily fractions results in an acceptable early radiation reaction and will avoid late damage to the spinal cord. For most patients, a three-dimensional CT planned phase two volume will be required. The optimum beam arrangement, usually incorporating conformal beam shaping assisted by use of a multileaf collimator, should avoid further dose to the cord. The aim of treatment is to deliver 60 Gy in 30 daily fractions over six weeks using 4–6 MV photons.

Conclusion: External beam radiotherapy has a role in each histological type of thyroid cancer. Most tumours are only moderately radioresponsive but with high dose treatment, local control and survival can be improved.

Disorders of the thyroid gland – radionuclide therapy.

Susan E. M. Clarke
Department of Nuclear Medicine, Guy's Hospital, St Thomas Street, London SE1 9RT, UK. Fax: 0171 955 4657.

^{131}Iradio-iodine has been used to treat thyrotoxicosis for over 50 years. Surveys of practice in Europe and the USA confirm that this is now the second line treatment of choice for patients who fail a course of anti-thyroid medication. Recently radio-iodine has also been used to treat patients with non-toxic multinodular goitres as an alternative to debulking surgery. This approach is particularly appropriate in the elderly or those unfit for surgery.

^{131}I radio-iodine has also been used for many years in the management of patients with differentiated thyroid cancer of the follicular and papillary variety. It is used to both ablate remnant thyroid tissue and to treat recurrent and metastatic thyroid carcinoma. Its value in treating patients with small primary tumours remains the subject of debate, but its role appears well established in patients with significant risk factors including the older population with large tumours and metastatic disease. The issue of ^{131}iodine stunning in the tracer scan is currently the subject of investigation.

Whilst ^{131}iodine has little role to play in the management of patients with medullary thyroid carcinoma, ^{131}I-metaiodobenzylguanidine (MIBG) has a limited role in the 30 per cent of patients whose recurrent tumours take up this radiopharmaceutical. Whilst at present the data confirms palliative responses to MIBG treatment, its role earlier in the disease has yet to be fully explored. Other new radionuclide therapy agents for medullary thyroid cancer include ^{111}indium octreotide, $^{186/188}$rhenium, pentavalent dimercaptosuccinic acid (V-DMSA) and ^{131}iodine anti-CEA antibody.

Patients with anaplastic carcinomas and Hurthle cell tumours are rarely helped with radionuclide therapy although pain from bone metastases may be palliated using ^{153}samarium phosphonate (EDTMP).

09.00–11.00 **PLENARY SESSION 9** (Queen's College)

ADVANCES IN ORL IMAGING
Chairman: Professor M. J. Gleeson (UK), Professor A. Jackson (UK)

Advances in head and neck diagnostic radiology.

T. J. Vogl
Department of Diagnostic and Interventional Radiology, University Hospital of Frankfurt, Johann Wolfgang Goethe University, Theodor Stern Kai 7, 60590 Frankfurt, Germany. e-mail: t.vogl@em.uni-frankfurt.de

Background: To present advances in Head and Neck Diagnostic Radiology.

Introduction: Current advances in Head and Neck Radiology are directed towards a further improvement of imaging technologies such as ultrasound, computed tomography (CT), magnetic resonance (MR) and superselective angiographic techniques. Additionally interventional image-guided techniques for biopsies and treatment are currently under evaluation.

https://doi.org/10.1017/S0022215100158189 Published online by Cambridge University Press

Methods: Helical CT has been methodically improved and allows now a rapid and reliable evaluation of the bony skull base structures and the paranasal sinuses. Virtual endoscopy is providing some interesting data on the pretreatment planning in functional sinus surgery. Magnetic resonance techniques are rapidly improving and expanding the use of imaging techniques in the head and neck. High resolution MR imaging of the inner auditory canal and the labyrinth allow an insight into pathologies of the inner ear structures and a detailed diagnosis of even submillimeter topographical structures. MR angiography is currently improving the non-invasive diagnosis of vascular tumours especially in the skull base and the parapharyngeal spaces. MR sialography is going to replace invasive sialography in some clinical settings. MR spectroscopy plays a definite role in the evaluation of recurrent tumours of the head and neck and the development of reticuloendothelial specific contrast agents could improve the diagnostic evaluation of neck nodes in patients with head and neck cancer. The newest advances are using MR thermometry for monitoring treatment in head and neck cancer, MR guided laser induced themotherapy presents promising results of local tumour control and reduction of clinical symptoms of patients suffering from recurrent head and neck cancer.

Conclusion: Newest advances in Head and Neck Radiology are expanding the current role of imaging techniques in this specific area.

Interventional neuroradiology in otolaryngology.

A. Valavanis
Institute of Neuroradiology, University Hospital of Zurich, CH 8091 Zurich, Switzerland. Fax: 41 1 2554164.

The spectrum of applications of interventional neuroradiology in the field of otolaryngology includes 1) preoperative embolization of hypervascular tumours (paragangliomas, angiofibromas, skull base meningiomas, other tumours); 2) balloon occlusion test of the internal carotid artery in cases with tumours involving the wall of the artery and – in appropriately selected cases – permanent balloon occlusion of the internal carotid artery; 3) curative or pre-operative embolization of haemangiomas and vascular malformations of the head and neck; 4) endovascular management of vascular lesions of the skull base (aneurysms of the petrous internal carotid artery, dural arteriovenous shunts) and 5) endovascular treatment of epistaxis.

In the past decade significant advances in interventional neuroradiology as it relates to otolaryngology have been achieved, including the application of functional concepts in the vascular anatomy of the head, neck and skull base, an improved understanding of the vascular architecture of the lesions treated by endovascular techniques and the introduction of high-resolution, biplane, digital subtraction angiography as well as of improved endovascular tools. These advances contributed significantly to an improved efficiency of interventional neuroradiology in otolaryngology.

Positron emission tomography in head and neck cancer – a review.

W. L. Wong
The Paul Strickland Scanner Centre, Mount Vernon Hospital, Northwood, Middx HA6 2RN, UK.

Computed tomography (CT), magnetic resonance (MR) and ultrasonography compliment clinical assessment in the evaluation of head and neck cancer. They provide unparalleled morphological detail but cannot reliably and consistently distinguish between active disease, reactive changes and the sequelae of treatment.

One of the hallmarks of malignant tissue is its abnormal metabolism. Positron emission tomography (PET) using the appropriate radionuclide can exploit these differences in metabolism. Abnormal amino acid metabolism can be studied with methionine and derangement in glucose metabolism can be demonstrated with 2-[18F]-fluro-2-deoxy-D-glucose (FDG).

Based on a review of the English and German literature (1988–1998) and also drawing from personal experience the value of PET FDG in the assessment of primary and recurrent/residual head and neck squamous cell cancer will be discussed. The role of PET FDG in detecting the occult head and neck malignancy will be considered. The potential role of PET FDG in imaging other tumours such as salivary gland and glomus tumours will be surveyed.

Imaging diagnosis of temporal bone disease.

P. D. Phelps
The Royal Free Hampstead NHS Trust, RNTNE Division, Grays Inn Road, London WC1X 8DA, UK. Fax: 0171 833 5518

Computed tomography (CT) is the imaging investigation for conductive deafness to show the bony anatomy and is necessary prior to cochlear implantation. CT will show fractures and with densitometry is used for bone dysplasias such as otosclerosis. Magnetic resonance imaging (MRI) is best when there is asymmetrical sensorineural deafness. The main lesion to be shown or excluded by MRI is schwannoma of the VIIIth cranial nerve. This can be done by the latest thin fast echo by 2D or 3D T2-weighted sections which will also depict lesions in the brainstem, and temporal lobe. Lack of high signal in the coils of the cochlea indicating abnsence of fluid is a relative contraindication to cochlear implantation. Contrast enhanced MR is used to show inflammation of the facial nerve but also of labyrinthine fluids. Aided by fat-suppression techniques enhanced MRI is needed to show tumours of the temporal bone especially meningiomas and glomus tumours which may be difficult to differentiate from fat below the skull base. CISS or T2 images can now give such good soft tissue spatial resolution that demonstration of normal fluid in the labyrinth and normal cranial nerves in the IAM are sufficient for a screening investigation for acoustic neuroma and for confirming the presence of a cochlear nerve when implantation is considered in a congenitally deaf child.

Computer-assisted surgery in paranasal sinus disease.

R. Hauser
Department of Otolaryngology, University of Basel and Freiburg, D 79102, Freiburg, Germany. Fax: 49 761 289040. e-mail: hauserr@aol.com

The surgical treatment of lesions involving the paranasal sinuses has always been, and continues to be, a challenge for even the most dextrous and skilled rhinologist. Two fundamental problems trouble those undertaking endoscopic or microscope-assisted surgery of the paranasal sinuses. Firstly, loss of spatial orientation during surgery may result in very serious complications for the patient. Secondly, the knowledge that serious complications may ensue deters some surgeons from using appropriate but

difficult surgical techniques. The combination of these two factors results in disease being left behind and revision surgery being required, with all its attendant difficulties for the operator consequent upon loss of landmarks etc.

The solution for some of these problems is at hand – a method to enhance visual and spatial orientation during surgery. The author will detail his contribution to the development of non-invasive image-guidance methods and present his personal experience gained during more than one hundred computer-assisted operations. The advantages and disadvantages will be discussed.

As image-guidance systems are improved and surgeons become more proficient and comfortable with their use, there should be fewer intra-operative complications and better post-operative outcomes for our patients. However, modern methods cannot and never will be able to replace basic surgical skills and a thorough knowledge of paranasal sinus anatomy. It would be folly to think otherwise.

Stereotactic advances in skull base surgery.

M. O'Leary
Neurotology/Skull Base Surgery, Naval Medical Center, 34800 Bob Wilson Drive, San Diego, California 92134-5000, USA. e-mail: oleary@snd10.med.navy.mil

Although computers have impacted most fields of human endeavour, surgery has been a relatively late arrival to the party. Current generations of frameless stereotactic systems promise to reverse the snub, particularly for operators in the skull base region. Employing accurate, 'real-time' MRI and CT images greatly facilitates navigation, enabling true 'minimal morbidity' techniques without the need for a full, open view of the field.

An overview of the evolution and review of modern stereotactic systems will be presented, comparing the features of the various localization technologies (mechanical, electromagnetic, radiofrequency, infrared, and reflected optical). New developments include a lightweight, voice-activated stereoscopic 'heads up' display system, freeing the endoscopic surgeon from the tether of the two dimensional television monitor. Specific stereotactic applications to microsurgery of the middle cranial fossa approach and stereoendoscopic transphenoidal hypophysectomy will be presented.

Coupled with knowledge of the precise anatomy critical to skull base surgery, frameless stereotaxis offers the minimally invasive surgeon a panoramic image from a porthole view. Improved patient outcome is the ultimate measure of benefit from this digital advance.

11.45–12.30 **KEYNOTE LECTURE** (Corn Exchange)
Chairman: Mr W. T. Farrington (UK)

The nature of evidence.

Professor A. G. D. Maran

The Royal College of Surgeons of Edinburgh, Nicolson Street, Edinburgh EH8 9DW, UK. Fax: 0131 557 9771. e-mail: president@rcsed.ac.uk

The reason that all healthcare systems are turning towards protocols, guidelines and evidence-based medicine is that health costs too much. Wherever the money comes from to fund health, everybody pays. Because of the apparent 'blind rush' of the profession towards evidence-based medicine with the implication that everything has an evidence-base, this talk directs itself to what exactly evidence is.

Evidence-based medicine started with Dr Codman of Boston and an account is given of his work in the Massachusetts General Hospital.

The philosophical nature of evidence looks at a very much wider range than sciences do. There are those things that are not necessarily truths, nor do they rest in experimental evidence. There are many things that experiments cannot prove and will almost always remain debatable. There are bad reasons for believing, such as tradition, authority and revelation.

In law, we have the two standards of evidence in civil and criminal courts.

Scientists have a very much more rigorous view of what level of evidence is required before a proof is obtained. Surgeons have great difficulty in creating an evidence-base because of the relatively small numbers that they deal with and also because many of the things they do are obvious, such as draining a bladder and incising an abscess, etc.

If you want to gather evidence, you have to ask four questions–

1) What sort of problem requires evidence for its solution? 2) What sort of evidence is appropriate for this particular problem? 3) What weight of evidence is adequate for a decision? 4) For whom must it be adequate?

This is addressed with many clinical examples.

Health Technology Assessment depends on evidence and an account is given of the work of SERNIP, of which the speaker is Chairman. This body looks at the introduction of new interventional procedures and in two years of its existence, a great deal of information has been obtained about how to assess something that does not have a large literature base.

The ultimate pathway of evidence is in the construction of guidelines. The establishment of NICE in England is going to produce protocols rather than guidelines. An account is given of the work of the Scottish Intercollegiate Guidelines Network that has, for the past five years, produced very expensive, but evidence-based, guidelines.

https://doi.org/10.1017/S0022215100158189 Published online by Cambridge University Press