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EDITORIAL *VAN DIE REDAKSIE*

Whither Radiology?

The concept of diagnostic radiology dating from the discovery of X-rays by Röntgen, and since then developed into a highly sophisticated branch of medicine, faces revolutionary changes in the near future, which are but a continuation of changes brought about in the immediate past.

Computerised transverse axial scanning (CTAS) was first reported in 1972.[1] A scintillation counter, instead of X-ray film, is used as primary detector. The system is approximately 100 times more sensitive than conventional X-ray systems. The aim is to produce a series of images by a tomographic method, and absolute values of the absorption coefficient of the tissues are obtained.

There is very little doubt that cerebral angiography will eventually be superseded by CTAS. Using CTAS, a complete brain scan encompassing examination and calculations at present takes 13 minutes—4 minutes for the examination and 9 minutes to calculate and provide the final result, with no discomfort to the patient. Compare this with a carotid angiogram! The manufacturers of the scanner are at present concentrating on reducing the calculation time and are confident that they will succeed in solving what is regarded by some busy institutions as a bottleneck.

Ultrasonography is based upon the plotting of echoes from within the body which indicate changes in tissue acoustic impedance to the transmission of sound waves, the frequency of which is far in excess of those audible to animals. Sonar should not be confused with X-rays, which have biological effects due to the production of ionising radiation, whereas ultrasound is vibrational or mechanical energy of an ultrahigh frequency.

Ultrasound has taken over from conventional radiology in quite a few instances and encroached upon other fields. This phenomenon has been welcomed by radiologists. As an adjunct it is invaluable, and in the obstetrics and gynaecology fields one hopes for a complete take-over, since present indications are that ultrasound is safe. The average non-radiologist is still not aware of the very definite danger of irradiation to the mother and fetus during X-ray examinations, and requests for pelvimetry are abused and at times verge upon the irresponsible. Radiologists should consider every request upon its merits and only in such cases where the life of mother and/or child is in danger, should the examination be undertaken.

Xeroradiography is an electrostatic method of image-recording which does not require the use of silver. It is extensively used in mammography, where it is superior to conventional radiography in all conditions except cysts. At the moment the limiting factor against general usage is the high incidence of irradiation, but with the extensive research presently in progress this problem will undoubtedly be overcome and then xeroradiography will come into its own. Imagine a chest examination where skin, subcutaneous tissue, ribs, lungs, heart and spine are clearly visible as equal and separate densities on the postero-anterior examination, or a lateral cervical spine with skin, subcutaneous tissue, bony components and air-containing organs also of similar density. This is what xeroradiography produces.

Whereas diagnostic isotopes, thermography and sonography have become valuable adjuncts to conventional radiological examination, we are now faced with procedures that will without doubt replace present methods of examination, namely computerised transverse axial scanning (tomography) and xeroradiography. In view of this there should be strict control over the acquisition of apparatus for new departments and replacement of existing units to eliminate unnecessary expenditure on equipment that may be redundant within the foreseeable future. It is suggested that a committee consisting of suitably qualified members be appointed to give advice and guidance on a country-wide basis.

1. Ambrose, J. and Hounsfield, G. (1973): Brit. J. Radiol., **46**, 148 (abstract).

Radioterapie as Loopbaan

Met 'n terugblik oor die afgelope bykans 80 jaar sedert Röntgen in 1895 X-strale ontdek het, is dit vir ons moeilik om vandag die roerende en seëvierende kaleidoskoop van geneeskundige gebeurtenisse voor die geestesoog te herroep—waarlik amper 'n eeu van wonderwerke! Vandag is dit nie alleen ontstellend maar ook rusverstorend dat in hierdie moderne tydperk van kernenergiegebruik in die geneeskunde so min geneeshere geïnspireerd voel om die spesialiteit van radioterapie as loopbaan te volg. Dwarsdeur die wêreld heers daar 'n nypende tekort aan radioterapeute—wat 'n skokkende toedrag van sake is, veral met die toename in kanker—en die vervaardiging van wonderlike radioterapie-apparate, om die stryd teen kanker aan te pak. In Amerika alleen word daar tans 1 500 radioterapie-apparate om die stryd teen kanker aan baar, d.w.s. een-vyfde van die vereiste getal. Hier in Suid-Afrika, proporsioneel gesproke, sit ons met dieselfde tekort van vier-vyfdes. Ons kan net een uit elke vyf van die bestaande poste vul.

Radioterapie en kanker is sinsverwant: die vakgebied behels 'n studie in diepte van kanker, die siekte, en radioterapie, die middel. Kanker is vandag die tweede belangrikste oorsaak (naas hartvaatsiektes) van dood by volwassenes, en die belangrikste by kinders. Vir die geneesheer van die hede is daar geen groter uitdaging op die gebied van navorsing en behandeling as kanker nie. Dit is agtenswaardig om daarop te let dat wêreld-kankerstatistieke toon dat by 'n monsterbevolking van 500 000 daar in enige bepaalde jaar verwag kan word dat die berekende getal kankerpasiënte onder geneeskundige toesig vir daardie jaar die syfer van 2 150 sal beloop; met 'n sterftesyfer van 750; 'n toeloopsyfer van nuwe kankerpasiënte van 1 400; en met 'n genesingsyfer van 465. Die berekende getal persone uit daardie monsterbevolking wat uiteindelik aan kanker gaan ly is 125 000, terwyl die dodetal 75 000 sal wees. Hierdie onstellende statistiek behoort ons aan te spoor om met hernude pogings die stryd teen kanker aan te durf; maar dit kan nie geskied sonder die nodige manne- en vroue-krag nie. Daar lê die uitdaging.

Radioterapie is vandag die belangrikste middel tot ons beskikking om die grootste getal kankers te genees of te beheer. Genesende chirurgie is net moontlik in ongeveer 20% van gevalle; radioterapie word verwag om die oorblywende 80% te behartig. Kankerchemoterapie en hormoonterapie speel 'n belangrike rol as palliatiewe terapie by wydverspreide kanker, hoewel kankerchemoterapie in die afgelope 8 jaar sy grootste bydrae gelewer het met sy genesende potensiaal by daardie dodelike kinderkanker, naamlik, akute limfatiese leukemie. Dis skitterende vooruitgang, maar terselfdertyd moet besef word dat hierdie vooruitgang geskied met behulp van radioterapie van die brein by hierdie kinders. Dit beklemtoon die nodige spanwerk wat moet heers tussen chirurg, radioterapeut en kankerchemoterapeut, as die beste behandelingsprotokol, afsonderlik of gesamentlik, vir die kankerpasiënt opgestel moet word met die doel om genesing te bewerkstellig, en as dit nie kan nie, om die kanker so te beheer dat die pasiënt 'n lewe kan lei wat die moeite werd is. Ten einde hierdie doel te bereik moet die radioterapeut kennis dra van al die middels wat in die stryd teen kanker gebruik kan word.

Die kursus in radioterapie strek oor 4 jaar in 'n kliniese assistent-pos in die Departement Radioterapie. Die basiese vakke is anatomie, fisiologie en fisika; die byvak is patologie (waar kanker deeglik bestudeer word) en die hoofvak is radioterapie (insluitende kankerchemoterapie, radioaktiewe isotope, en teoretiese chirurgie). Die meeste geneeshere vrees die vak fisika, maar enige dokter wat fisika vir die graad M.B. Ch.B. verwerf het, hoef nie die fisika van radioterapie te vrees nie; dis ook baie interessanter, want dit gaan meesal oor atoomfisika. Verder word die nouste samewerking op kliniese gebied met ander dissiplines gehandhaaf. Na kwalifikasie volg bevordering in die Departement Radioterapie baie vinnig, weens die tekort aan personeel. 'n Mens kan boekstaaf dat daar niks so opwindends is as die talle nuwe radioterapie-eenhede wat gedurig op die mark verskyn nie, soos telekobalt apparate, liniêre versnellers, siklotronne, betatronne en bevatronne, asook 'n hele reeks radioaktiewe isotope. Voorwaar, hier lê 'n grenslose veld braak vir die navorsende en beplannende radioterapeut van môre! Ons kan nie wag vir die toestroming van radioterapie-kandidate om hierdie uitdaging aan te durf nie!