X ray

X-radiation (composed of X-rays) is a form of electromagnetic radiation. Most X-rays have a wavelength ranging from 0.01 to 10 nanometers, corresponding to frequencies in the range 30 petahertz to 30 exahertz (3×1016 Hz to 3×1019 Hz) and energies in the range 100 eV to 100 keV. X-ray wavelengths are shorter than those of UV rays and typically longer than those of gamma rays. In many languages, X-radiation is referred to with terms meaning Röntgen radiation, after Wilhelm Röntgen, who is usually credited as its discoverer, and who had named it X-radiation to signify an unknown type of radiation. Spelling of X-ray(s) in the English language includes the variants x-ray(s), xray(s) and X ray(s).

History in Neurosurgery

Valuable help has come from the roentgen ray, and stereoscopic films of the skull now reveal much that was not seen in the old plates. Calcification in tumors is demonstrated quite frequently; it is no longer difficult to- determine -whether the sella turcica shows pathological changes; proliferation of the skull over a dural tumor may be an ingrowth of new bone, impossible to detect except with the roentgen ray; and localized erosions of the skull are frequently significant.

The most important advance came with the introduction of cerebral pneumograms or ventriculograms by Dandy of Baltimore in 1918. Cerebrospinal fluid is withdrawn from the ventricles, and air is injected in its place. Roentgen rays then give a picture of the ventricular system, because the air casts no shadow. All tumors of the brain which give symptoms of pressure produce distortion or change in the size, shape or position of the ventricles.

Dandy says that ten years ago less than 50 per cent of tumors of the brain could be exposed at operation; that now exposure is possible in 65 per cent because of better roentgen rays, better surgery and increased experience; and that all the remaining 35 per cent can be localized by the cerebral pneumogram. Have others been able to confirm this statement? Grant collected 392 cases from the records of several neurosurgeons. The method was of value in 311 cases, but in 218 it confirmed a neurological diagnosis, or was unverified, or ruled out a suspected tumor. Ninety-three tumors were localized and exposed at operation solely through -the aid of the pneumogram. There were errors of technique in 10 per cent of the cases, and the mortality was 8 per cent. But the mortality of unlocalized tumors is 100 per cent, and of the ninety-three tumors which could not have been local- [1)]

Based on the currently limited data, there is no association between exposure to dental X-rays and the risk of development of meningioma. However, these results should be cautiously interpreted because of the heterogeneity among studies. Additional large, high-quality clinical trials are needed to evaluate the association between exposure to dental X-rays and the risk of development of meningioma [2)].

see Cervical spine x ray

see Lumbar spine x ray

1)
Grant, Francis C.: Ventriculography, Arch. Neurol. and Psychiat, 14:513 September, 1925.
2)
Xu P, Luo H, Huang GL, Yin XH, Luo SY, Song JK. Exposure to Ionizing Radiation during Dental X-Rays

Is Not Associated with Risk of Developing Meningioma: A Meta-Analysis Based on Seven Case-Control Studies. PLoS One. 2015 Feb 6;10(2):e0113210. doi: 10.1371/journal.pone.0113210. eCollection 2015. PubMed PMID: 25658814.