



Important Notes in the Cranial Computerized Tomography Scanning Interpretation and Its Role in the Detection of CNS Abnormalities and Lesions Including Brain Tumors



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Abstract

Central nervous system pathologies can be detected by employing various imaging modalities. Among others, the computerized tomography scanning, or CT scanning is an important imaging modality to detect various intracranial lesions including brain tumors. Given its availability in basic clinical settings which is more than advanced neuroimaging modalities, CT scanning can be a useful and easy to access imaging technique to detect central nervous system pathologies. Although it has some limitations but still CT scanning is a useful modality to detect central nervous system pathologies including brain tumors. Considering this, it is important for the clinicians to have knowledge to interpret the results of the CT scanning of the central nervous system, so that they can detect abnormalities and pathologies with more precision. This brief review tries to point to some important notes in the interpretation of the results of cranial computerized tomography scanning in detection of various central nervous system pathologies including brain tumors.

Keywords: Cranial CT scanning; Interpretation; CNS lesions; Brain tumors; Important notes

Mini Review

Cranial CT scanning is a valuable imaging technique to detect various cranial pathologies including brain tumors. Interpretation of the cranial CT scanning results requires having knowledge about the normal anatomy and possible variations of the brain, relevant structures, and surrounding ones. Having such knowledge is important to detect abnormalities and pathologies which have been affected the brain and such structures and have made changes in the normal anatomy and function of the brain, relevant structures of the brain and surrounding brain structures. During interpretation of the results of cranial CT scanning and before enhancement with contrast, in skull base and vault, searching should be done to find any depressed fracture, osteolytic lesion, hyperostosis and remodelling. In the ventricular system, attention to the position and size and the presence of any horns compression should be done. Evaluation of the width of the sylvian fissures and cortical sulci should also be done [1,2].

In cranial CT scanning, multiple lesions may be found which can be the consequences of any trauma, granuloma, abscesses, infarction or tumors like lymphoma and metastases which have been affected the brain, relevant structures, and surrounding ones. Attention to any abnormal tissue density should also be done.

For lesions, their position should be of attention that whether they are in or out of the brain substance. Low density lesions can be seen due to any edema, tumor, encephalitis, arterial or venous infarction, resolving hematoma or abscess while high density lesions can be seen due to any calcification, aneurysm, blood, hamartoma or arteriovenous malformation. Mixed density lesions can be seen due to any contusion, arteriovenous malformation, tumor, hemorrhagic infarct or abscess. Paying attention to any mass effect including compression of the ventricles, midline shift and basal cisterns and sulci obliteration should also be done.

About the presence of calcification, it should be of notice that in normal cases, falx, choroid plexus, basal ganglia, and pineal gland calcifications can be seen and these should be considered as normal findings [3,4].

After enhancing with contrast, paying attention to the pattern and extent of uptake of the contrast in abnormal areas should be done with precision. There may be some lesions that only can be seen with using contrast. The appearance of willis circle vessels in basal slices, would be done after enhancing with contrast and these vessels can be evaluated afterwards. Detection of some brain tumors with CT scanning can also be done. In these cases, paying enough attention to the location of the tumor, its possible extension to the relevant structures of the brain or the structures which are surrounding the brain and the presence of multiple lesions should be done. In these cases, the affected patients should be evaluated more in search of finding any clinical neurological deficits. This would be of importance and help to detect the brain tumors and their types in a better way by using CT scanning and comparing the results with possible clinical findings. Using more advanced neuroimaging modalities to detect the brain tumors can be done afterwards [1,5].

Conclusion

Cranial CT scanning is a valuable neuroimaging modality to study the brain, the relevant and surrounding structures and the lesions and pathologies which can affect the brain. Considering this, it is important for the clinicians to have enough knowledge to interpret cranial CT scanning results properly so that they can detect various brain abnormalities and lesions including brain tumors with more precision at the bedside. .

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