SUNTEXT REVIEWS

SunText Review of Case Reports & Images
ISSN: 2766-4589

Open Access
Commentary Article
Volume 3:4

Radiology Education and Pareidolia: A Literary Criticism

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Received date: 15 October 2022; **Accepted date:** 27 October 2022; **Published date:** 31 October 2022

Citation: Alahmari A (2022) Radiology Education and Pareidolia: A Literary Criticism. SunText Rev Case Rep Image 3(4): 159.

DOI: https://doi.org/10.51737/2766-4589.2022.059

Abstract

Pareidolia is the tendency for perception to ascribe a meaningful interpretation to an ambiguous stimuli, typically visual, such that one perceives an object, pattern, or meaning when none exists.

Keywords: Pareidolia; Assessing radiographs; Radiology imaging

Commentary Article

Pareidolia is the tendency for perception to ascribe a meaningful interpretation to an ambiguous stimuli, typically visual, such that one perceives an object, pattern, or meaning when none exists. Pareidolia and patternicity are two techniques that medical educators occasionally instruct medical students and resident physicians (doctors-in-training) to utilize to learn to identify human anatomy on radiology imaging examinations. Assessing radiographs (X-ray radiographs) of the human vertebral spine is one example. Pareidolia is utilized to teach medical trainees how to check for spinal fractures and spinal malignancies. According to Patrick Foye, M.D., professor of physical medicine and rehabilitation at Rutgers University, New Jersey Medical School (cancers). Normal bony anatomic landmarks on spinal radiographs resemble an owl's face, (The spinous process and spinal pedicles resemble an owl's beak and eyes, respectively). However, the radiographic image alters so that the owl's eye now seems to be missing or closed, which is known as the "winking owl sign," when malignancy erodes the bony spinal pedicle. On a spinal x-ray, the "Scottie dog sign" is another typical pattern. In a paper titled "Baby Yoda: Pareidolia and Patternicity in Sacral MRI and CT Scans" from a medical journal, Foye once more made a contribution to the existing knowledge on this subject in 2021. He described a novel technique for viewing the sacrum on CT and MRI scans. He observed that in some imaging slices, the human sacral anatomy resembles the face of "Baby Yoda," a made-up character from the television series “The Mandalorian” (also known as Grogu). The sacral canal resembles the Baby Yoda's mouth, while the sacral foramina, which are sacral holes for leaving nerves, resemble the baby Yoda's eyes. There is a published book called Neuroradiology Signs by Dr. Ho which mainly focus on signs in neuroradiology scans which basically another word for pareidolia and patternicity [1]. All different signs like molar tooth sign of midbrain affected by joubert syndrome, moose head sign of corpus callosum affected by dysgenesis, racing car sign of corpus callosum affected by agenesis, etc. Pareidolia makes it easy for a radiology resident to know how to different diseases appearances by using these signs. There are many occasions where these signs do not follow the classic pareidolia and patternicity. For example, a published paper did not show the classic Mount Fuji sign of pneumocephalus [2]. The classic sign did not appear like in the classical way. Patterns and pareidolia could lead to a wrong diagnosis, for inexperienced medical professionals. Human nature can lead to illusion and started imagining patterns that do not exist due to the tendency of humans to make a pattern from a random stimuli. This method of teaching metaphorical signs can make the interpreter see patterns that do not exist. This is like medical student syndrome when the medical student start studying different disease then start applying it on him/herself. Similarly, if you read about a rare medical condition that appears in a certain way on radiology examinations and you became really interested in this condition and you started

looking in all your patients scans to find this condition, your brain might trick you to imagine that disease appearance in all of your patient in hope you find one which will lead you to the wrong diagnosis certainly. For example, if you read a paper about eagle syndrome which is calcified stylohyoid ligament, then when you see a long styloid process you might think that's it! This case must be an eagle syndrome patient! But the measurements and the criteria differ by stating that the styloid process must be above 3.2 cm and less than that is a normal length, not an elongated process. The whole thing started by the interpreter obsession with a medical condition and the interpreter wish (wishful thinking) to find this condition in his/her patients. Pareidolia in such cases, will make it worse for sure! In a study that was done to assess the usefulness of radiology signs in teaching. Both groups were tested by showing them radiology scans. One group were taught radiology metaphorical signs and the other group were not taught any radiology metaphorical signs. It showed that the group who did not tough radiology signs scored a 9% less correct answers than the group whom were taught the radiology metaphorical signs. The issue is that 9% of the group whom did not taught the metaphorical signs already mentioned the radiology signs in their answers for some of the radiology scans which used to evaluate the ability of each group. So the study result is not accurate [3].

Conclusion

Pareidolia can lead to subjective opinions and lack of a well-established criteria for diagnoses. The huge amount of radiology signs could lead to confusion rather than a good approach of teaching and learning. Many classical signs do not appear in their classical appearance in many patients. Therefore; the student need to be informed that sometimes the signs maybe look in the same way, a little bit different, or totally opposite to the classical sign.

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