Novel diagnostic procedure

Facebook: can it be a diagnostic tool for neurologists?

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Summary

A 56-year-old woman presented with acute ischaemic stroke with NIHSS 13. She had right eye ptosis and miosis. She and her husband were not sure if her facial features were different than usual. With her consent, we compared her face with her pictures on Facebook. In the absence of any ptosis or miosis in her pictures, she was diagnosed with acute Horner syndrome. Facebook may be a useful tool for the neurologists to define the timing of facial neurological signs.

BACKGROUND

Facebook is a social media website with more than 845 million monthly active users. It has been increasingly used in healthcare for patient education, research enrolment, patient follow-up, behavioural research, and changing health policies.^{1–4} Most of the residents and fellows have a Facebook profile.⁵

Literature review did not show any published cases where Facebook was used as a diagnostic tool in neurology. We describe here a patient with acute neurological emergency where Facebook played a significant role in her diagnosis.

CASE PRESENTATION

A 56-year-old previously healthy, non-smoker female had sudden onset of left-sided hemiparesis, left facial droop, and dysarthria. She was taken to a local emergency room. Computed axial tomography (CAT) scan of the head did not show any acute bleed but did show right hyperdense middle cerebral artery (MCA) (figure 1A). Two hours after acute stroke onset, 50 mg of intravenous tenecteplase was given and the patient was transferred to Saint Mary hospital via helicopter.

At arrival, NIHSS was 13 for slurred speech, right gaze deviation, left moderate facial droop, complete left hemiparesis and left haemineglect.

INVESTIGATIONS

Cerebral angiogram showed 95% stenosis of right internal carotid artery (ICA) at its origin along with right MCA occlusion (figure 1B). Angioplasty resulted in good recanalisation, thrombolysis in cerebral ischaemia (TICI) 2b⁶ across the MCA with persistent occlusion of posterior M2 MCA branch. Left carotid injection demonstrated cross fill from left to right with excellent left meningeal collaterals to fill the non-perfused M2 territory. Repeat angiogram showed restenosis of ICA origin, following which an Enterprise carotid stent was placed with TICI 2c flow in ICA (figure 1C). Patient's NIHSS was three (left mild facial droop, mild dysmetria, and mild extinction) immediately postprocedure. Patient was loaded with aspirin

324 mg and clopidogrel 300 mg. She was transferred to neurological intensive care unit for closer monitoring.

In the intensive care unit, she was noted to have right ptosis and mild right miosis with pupil 0.6 mm smaller than the left side (figure 1D). She and her husband were not sure if her facial features were different than usual. We checked her driver's licence but her picture was not clear enough to make a comparison. She had no other pictures with her. We asked her if she had pictures on her Facebook profile to which she responded affirmatively. As our patient was competent to give consent, we asked for her verbal permission to compare her pictures on Facebook with her present facial features to clarify if the eyelid droop was new or old. She gave us her verbal consent and showed us her Facebook profile pictures. After looking through eight profile pictures we found a recent close-up photograph showing no ptosis. Miosis was hard to access as the pupil difference was only 0.6 mm at present. Ptosis was thought to be new in onset. On further questioning, she admitted visiting a chiropractor 2 days ago for neck stiffness for which she underwent spinal manipulation. A diagnosis of right ICA dissection was established. Her laboratory testing showed haemoglobin 13.4 g/dl (reference range [RR]: 12–15.5 g/dl), International normalised ratio 1.0 (RR: 0.8–1.2), haemoglobin A1c 5.0% (RR: 4.0–6.0%) and low-density-lipoprotein 72 mg/dl (RR: <100 mg/dl). Her extinction improved the next day. Repeat CAT scan head at 24 h showed hypodensity in the insular cortex and lentiform nucleus.

TREATMENT

She was started on aspirin 81 mg daily, clopidogrel 75 mg daily, and simvastatin 20 mg daily.

OUTCOME AND FOLLOW-UP

She was discharged home after 5 days of hospitalisation with NIHSS of two and modified Rankin score of two.

DISCUSSION

Facebook helped us to reach to the correct aetiological diagnosis of acute ICA dissection in our patient. ICA dissection causes Horner syndrome via damage to the third-order

Figure 1 Non-contrast CT head showing right hyperdense middle cerebral artery (A). Cerebral angiogram showing 95% right internal carotid artery origin stenosis and occlusion of right middle cerebral artery (B). Postcarotid stenting cerebral angiogram showing recanalisation of right internal carotid artery and middle cerebral artery (C). Right eyelid ptosis and mild miosis consistent with Horner syndrome (D).

sympathetic neurons.⁷ Traditionally, neurologists used patients' driving licence or previous photographs to compare their picture to see if the Horner syndrome is new or pre-existing.⁸ There are several limitations to this approach, mainly poor quality of photograph, patient may have closed their eyes due to the flash making evaluation difficult, the photograph may be too old, dependency on a single photograph, fading of colours and outlines of photograph with time, and unavailability of driver's licence of paper photograph at the time of neurological emergency. Facebook offsets all these limitations of paper photograph by providing high-quality, recent, multiple digital, and close-up shots. Facebook can be easily accessed in a patient's room via a Smartphone, computer, Ipad and other android tablet, Iphone, or laptop.

Our patient's Facebook profile helped us to compare her current ptosis with her previous pictures at the bedside. This vital information helped us to find out the spinal manipulation done 48 h ago which might have led to ICA dissection, resulting in high-grade symptomatic stenosis and acute ischaemic stroke in our patient.

Facebook use has been increasing in healthcare over the last few years. There are several legal and ethical challenges in using social media such as Facebook use in healthcare for accessing patient information.⁹ Social media was originally designed for social communications between family and friends. Use of social media in medicine is new and the ethical issues related to an individual's privacy have not been delineated so far. Access to patient's information on social media via verbal or written consent may be appropriate if that information is used for the patient's medical care. All physicians, residents and students should be aware of patients' privacy while accessing their information via social media. This information should only be used for the patient's medical care free of any judgment about the patient as sometimes the pictures or the information provided on social media may be inappropriate in the boundary of the patient-physician relationship. Although information provided on Facebook is public, patient's informed consent must be taken prior to the use of Facebook or any other social media. Timely research is much needed in this area to explore these issues and guidelines are needed to direct physicians how to appropriately use this new exciting yet potentially

dangerous source of information. Facebook may be a useful diagnostic tool in patients with Horner syndrome and other neurological disorders like Bell's palsy, internuclear ophthalmoplegia, strabismus, Grave's ophthalmopathy and myasthenia gravis.

Learning points

- Facebook and other social media are increasingly being used by patients, and physicians.
- Recent pictures are available immediately using social media.
- Facebook may be a useful diagnostic tool in patients with Horner syndrome and other neurological disorders such as Bell's palsy, internuclear ophthalmoplegia, strabismus, Grave's ophthalmopathy and myasthenia gravis.

Competing interests None.

Patient consent Obtained.

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