LETTERS TO
THE EDITOR

Magnetic resonance imaging and vertebral artery dissection

Since the advent of advanced radiological modalities such as MRI and magnetic resonance angiography (MRA), dissections of cervical arteries are increasingly recognised as a common cause of stroke in young adults. Auer et al. recently advocated MRA as the initial diagnostic tool for vertebral artery dissection. Conventional angiography might be avoided altogether in subjects with a suspicious history and MRA images suggestive of a dissection (double lumen or mural haematoma). The sensitivity of MRA for the diagnosis of vertebral artery dissection was only 20% in one study, but the specificity was excellent (100%). The sensitivity was considerably better in the hands of Auer et al., but in this study the specificity (true negative rate in subjects free of disease) was not considered because all patients had vertebral artery dissection. The following case report illustrates that care must be taken to avoid false positive results when using MRA for the diagnosis of vertebral artery dissection.

A 47 year old male pilot suddenly experienced clumsiness and slight loss of strength in the right arm and leg during a long distance flight, while he stooped forward. During the following hours, he developed a global headache without irradiation to the neck, but the other symptoms gradually diminished. Prior history was unremarkable, except for a 3 hour period of horizontal diplopia which suddenly developed 3 months earlier. He had never smoked. Family history was negative for cardiovascular disorders. The patient later confessed that he had recently picked up the habit of gargling his throat with toothpaste twice a day, always with his neck in extreme retroflexion.

General physical examination (8 hours after onset of symptoms) was normal. Neurological examination showed minimal paresis and impaired dexterity of the right hand, mild circumduction of the right leg, and an insecure tandem gait. An MRI (including T1 weighted spin echo images with and without fat suppression, and proton density and T2 weighted fast spin echo sequences, performed on a 1.5 Tesla whole body MRI system) performed several hours later visualised both a fresh and an old right sided cerebellar infarct (figure A). In addition, MRI showed an irregular right vertebral artery in which a patient lumen was partially surrounded by a semilunar area of high signal intensity on T1 and T2 weighted images. On fat suppressed images, this area's high signal intensity persisted, excluding the possibility that it originated from perivascular fat. This image was suggestive of mural haematoma due to vertebral dissection (figure B). Because we were reluctant to base any treatment decisions (anticoagulants) merely on MRI findings, digital subtraction angiography was performed on the day of admission. This examination was normal (figure C). Shortly after this procedure, the patient developed vertigo and nystagmus which disappeared after 3 hours. Because we were puzzled by the discrepant findings on conventional angiography and MRI, we performed an MRA 4 days later. At this examination, the semilunar area of high signal intensity was found again (figure D), despite saturation of craniofugal and craniopetal flow respectively, which was applied to exclude the possibility that the high signal originated from flow in the periarterial venous plexus. Therefore, this examination was again suggestive of right vertebral artery dissection. An extensive search for other causes of stroke showed no abnormalities. Hence, due to the continuing discrepancy between conventional angiography and MRA, and due to the absence of any other cause of stroke, no certain diagnosis could be established.

In this patient, a diagnosis of right vertebral artery dissection was initially made given the clinical course with repeated episodes of ischaemia restricted to the vertebrobasilar system, as well as the suggestive MRI findings. We speculated that habitual gargling was a potential underlying cause, as neck retroflexion can cause cervical dissections. However, we had to reject this diagnosis in view of the normal conventional angiography, which remains the gold standard for diagnosing cervical artery dissection. In one series, conventional angiography was never falsely negative in patients with clinical signs or symptoms of vertebral artery dissection. The possibility that conventional angiography nevertheless yielded a false negative result seems highly unlikely. In dissected arteries, MRI/MRA can detect intimal flaps, mural haematomas, or aneurysmal dilatations that are sometimes missed by conventional angiography, but even in such patients, conventional angiography is never completely normal in the acute stage. Follow up examinations of patients with proven vertebral artery dissection indicate that the appearance of a dissected artery on conventional angiography can normalise in a substantial proportion of patients, but always after an interval of at least 1 to (usually) several weeks. Conventional angiography in our patient was performed on the day of admis-
Catatonia due to central pontine and extrapontine myelinolysis: case report

Central pontine and extrapontine myelinolysis (CPEM) are recognised complications of hypotension and its overly rapid correction. We describe a patient with CPEM in whom behavioural manifestations overshadowed corticospinal tract signs. A 64 year old Chinese speaking woman with a history of episodic psychotic depression that had never required admission to hospital was admitted to a hospital because of vomiting and diarrhoea. Her general and neurological examination were normal. On admission she had a sodium concentration of 105 meq/l. An infusion of 3% saline at a rate of 150 ml/hour was given during 6 hours. Ten hours later her sodium was 134 meq/l and she was mute and tetraparetic. She seemed catatonic with motor perseveration. Transfer to our hospital was requested.

On admission her vital signs were normal. She was mute without any spontaneous volitional movements except for visual pursuit. She was tetraparetic and hyperreflexic with increased tone and bilateral Babinski's signs. CPEM was suspected. Admission MRI, EEG, and spinal fluid examination were normal. Over the next 2 days the reflexes normalised and the Babinski's signs disappeared but she continued to have mild diffuse weakness. She had waxy flexibility and assumed bizarre non-physiological postures consistent with catatonia. Psychogenic unresponsiveness was suspected and she was started on risperidone and sertraline. There was no benefit. Electroconvulsive therapy was proposed by a psychiatry consultant but was refused by the patient's family. The clinical picture was dominated by an akinetic mutism with marked catatonia. Catatonia due to CPEM was considered. A repeat MRI 12 days after the onset of symptoms showed high intensity areas in thepons, caudate, and putamen consistent with CPEM (figure A, B). Physical and occupational therapy were instituted and she gradually recovered over the next 2 weeks. She was transferred to a rehabilitation hospital where she recovered completely and returned to live independently. She has been followed up at the neuropsychology clinic and has not shown any residual deficits.

CPEM usually presents with tetraparesis and pseudobulbar palsy. Unusual clinical presentations include extrapyramidal syndromes, ataxia, and neurobehavioural syndromes. Although psychiatric manifestations of CPEM have been recognised they usually manifest as an agitated delirium, or a pseudobulbar state with pathological laughing and crying. When present, neuropsychiatric symptoms are usually overshadowed by florid signs of brainstorm and pyramidal tract dysfunction. Behavioural changes such as inappropriate affect, emotional lability, personality changes, paranoia, poor judgement, emotional incontinence, and disinhibition have been reported. Price and Mesulam described a case of pontine myelinolysis in which transient pyramidal signs were followed by confusion, restlessness, pressured,tangential speech, and disinhibition. Our patient also had transient long tract signs but they were followed by a catatonic state. The extensive extrapontine myelinolysis present in our patient may explain the behavioural symptoms we encountered.

CPEM may present with unusual behavioural symptoms. At the onset of neurological deterioration MRI may be normal but subsequent imaging studies usually disclose the lesions. CPEM presenting with neuropsychiatric symptoms in patients with normal initial imaging studies might suggest a psychogenic aetiology. Corticospinal tract signs may be temporary. A strong index of suspicion for CPEM is required when patients with recent
hypoaesthesia present with behavioural changes. Akinetic mutism and catatonia may be the dominant clinical features in CPEM.

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**Association between butyrylcholinesterase K variant and the Alzheimer type neuropathological changes in apolipoprotein E ε4 carriers older than 75 years**

Apolipoprotein E (ApoE) ε4 has a strong influence on the development of sporadic Alzheimer’s disease in many ethnic populations. However, ApoE ε4 is neither necessary nor sufficient for the development of Alzheimer’s disease, suggesting that other genes increase the risk of Alzheimer’s disease. One such new candidate is the butyrylcholinesterase (BCHE) gene (BCHE). BCHE is associated with senile plaques (SPs) and neurofibrillary tangles (NFTs). Lehmann et al recently reported that the K variant of BCHE (BCHE-K) was associated with the development of Alzheimer’s disease, especially in ApoE ε4 carriers older than 75 years. A possible mechanism to explain BCHE-K’s effect on Alzheimer’s disease is that BCHE-K might be the dominant clinical features in CPEM. Akinetic mutism and catatonia may be the dominant clinical features in CPEM.

![BCHE genotypes and the densities of the SPs, NPs and NFTs in the hippocampus and superior temporal gyrus in ApoE ε4 carriers older than 75 years and non-ApoE ε4 carriers older than 75 years](image)

<table>
<thead>
<tr>
<th>BCHE genotype</th>
<th>ApoE ε4 carriers over 75 years (n=28)</th>
<th>non-ApoE ε4 carriers over 75 years (n=95)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K/K (n=8)</td>
<td>N/N (n=20)</td>
</tr>
<tr>
<td>Hippocampus:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPs</td>
<td>3.0 (0.0, 17.2)</td>
<td>12.2 (4.5, 28.7)</td>
</tr>
<tr>
<td>NPs</td>
<td>0.7 (0.0, 11.9)</td>
<td>11.0 (5.9, 25.3)</td>
</tr>
<tr>
<td>NFTs</td>
<td>1.1 (0.4, 23.1)</td>
<td>17.4 (2.5, 59.6)</td>
</tr>
<tr>
<td>Superior temporal gyrus:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPs</td>
<td>0.2 (0.0, 22.8)</td>
<td>49.7 (12.1, 83.8)</td>
</tr>
<tr>
<td>NPs</td>
<td>0.2 (0.0, 8.8)</td>
<td>10.7 (3.6, 19.0)</td>
</tr>
<tr>
<td>NFTs</td>
<td>0.0 (0.0, 0.2)</td>
<td>0.9 (0.4, 4.9)</td>
</tr>
</tbody>
</table>

Values are medians (25th percentile, 75th percentile). The density represents the average counts in 2.56 mm² for the SPs and NPs, and in 0.64 mm² for the NFTs. BCHE=butyrylcholinesterase gene; ApoE=apolipoprotein E; K=the K variant allele of butyrylcholinesterase gene; N=the normal allele of butyrylcholinesterase gene; SPs=senile plaques; NPs=senile plaques with dystrophic neurites; NFTs=neurofibrillary tangles.

Our neuropathological study disclosed a significant association of BCHE-K with Alzheimer type neuropathological changes in the ApoE ε4 carriers older than 75 years, but not in the non-ApoE ε4 carriers. Lehmann et al. showed that BCHE-K was strongly associated with the development of Alzheimer’s disease in the ApoE ε4 carriers older than 75 years. Analyses of the same subgroup of ApoE ε4 carriers older than 75 years increased statistical significance in both our studies and that of Lehmann et al. This suggests that BCHE-K and its genetic linkage with the development of Alzheimer’s disease would be different among sample populations.
The patient was a 71 year old, retired physician with a 3 to 4 year history of memory impairment. Neuropsychological evaluation disclosed a high average to superior general intellectual functioning, with mild impairment in naming to confrontation and episodic memory for verbal memory. His visuospatial ability remained relatively unimpaired and was rated as average for his age. His comprehension for verbal and written instruction was intact. At the present time he is still well oriented to time and place, and is somewhat independent in activities of daily living. He is, remarkably, not depressed, but does, repeatedly, raise concern regarding the fact that he has become to his wife. Moreover, mild hypoplasia in the frontotemporal lobes bilaterally was seen on SPECT investigation and no evidence of pathognomonic laboratory results were found. Taken together, the patient’s episodic memory and naming impairments and functional imaging findings was thought to be consistent with the early stages of dementia of Alzheimer’s type (DAT) in keeping with National Institute of Neurological and Communication Disorders Association-Alzheimer’s Disease and Related Disorders Association criteria. The patient was consequently referred to our department for “prospective memory book training” and follow up assessments to index progression of disease.

During our sessions his wife had stated that the patient could still remained intact. At the present time he is still well oriented to time and place, and is somewhat independent in activities of daily living. He is, remarkably, not depressed, but does, repeatedly, raise concern regarding the fact that he has become to his wife. Moreover, mild hypoplasia in the frontotemporal lobes bilaterally was seen on SPECT investigation and no evidence of pathognomonic laboratory results were found. Taken together, the patient’s episodic memory and naming impairments and functional imaging findings was thought to be consistent with the early stages of dementia of Alzheimer’s type (DAT) in keeping with National Institute of Neurological and Communication Disorders Association-Alzheimer’s Disease and Related Disorders Association criteria. The patient was consequently referred to our department for “prospective memory book training” and follow up assessments to index progression of disease.

Prosody is a non-verbal or suprasegmental feature of language that conveys various levels of information to the listener, including linguistic, affective (attitudinal and emotional), dialectical, and idiosyncratic data. The acoustical features underlying prosody include accentuation, melody, cadence, loudness, timbre, tempo, stress, accent, and pauses. These acoustical features are typically spared in patients with cortical dementia such as Alzheimer’s disease in which temporo-polar cortices are primarily affected. Patients with Alzheimer’s disease, however, often develop apraxia, which can be defined as a disorder of skilled motor movement not caused by weakness, ataxia, deafferentation, abnormal tone or posture, movement disorders (such as tremor or chorea), intellectual deterioration, poor comprehension, or uncooperativeness. Moreover, subtypes of apraxia have been delineated and are defined by the nature of errors made by the patient and the means by which these errors are elicited. Accordingly, a patient with probable dementia of Alzheimer’s type is described who had normal prosodic elements to his spontaneous everyday speech, but could not produce the same acoustical features underlying prosody to command. The nature of his errors might constitute what can be termed “ideomotor prosodic apraxia.”

<table>
<thead>
<tr>
<th>Place of prosodic apraxia scale*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Script to read</strong></td>
</tr>
<tr>
<td><strong>Type of emphasis</strong></td>
</tr>
<tr>
<td>1. Honey PLEASE!</td>
</tr>
<tr>
<td>2. Are you hungry?</td>
</tr>
<tr>
<td>3. You know.......there was a time when I could recte all the streets in my neighborhood</td>
</tr>
<tr>
<td>4. Holy Cow!</td>
</tr>
<tr>
<td>5. YUP, yup, yup, yup, yup...</td>
</tr>
<tr>
<td>6. La de da da.</td>
</tr>
<tr>
<td>7. O Canada, our home and native land...</td>
</tr>
<tr>
<td>8. SHIT!</td>
</tr>
<tr>
<td>9. Thank you</td>
</tr>
<tr>
<td>10. May I go to the bathroom, I really need to go quite badly...</td>
</tr>
</tbody>
</table>

Directions: Read the above word(s) and sentences as if you really mean them. Pretend you are auditioning for a play and you are required to read the lines with the type of emphasis noted beside each line.

*These items were selected based on observation of the patients spontaneous speech. Therefore, they are qualitatively constructed and should not be used as a general measure of prosodic apraxia with all patients.
white matter, in keeping with typical dominant hemispheric lesions producing transcortical motor aphasia. This speculation is supported by the patient’s SPECT findings of mild hypoperfusion in the frontotemporal lobes bilaterally.

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Vocal cord abductor paralysis in spinocerebellar ataxia type 1

Vocal cord abductor paralysis (VCAP) is considered a sign of a poor prognosis in neurodegenerative diseases, because severe laryngeal dysfunction by VCAP may result in acute airway obstruction and require emergency tracheotomy. Although VCAP is a cardinal feature in multiple system atrophy (MSA), it has not been reported in several types of spinocerebellar ataxia with dominant inheritance. We evaluated the movements of the vocal cords of seven patients with SCA1 by laryngofibroscopy.

Seven unrelated patients with SCA1 who had the expanded CAG repeat of ataxin-1 were investigated. There were two men and five women ranging in age from 27 to 67 years old (mean 44.5 years). Spouses and other family members, in addition to the patients, were questioned about events of stridor, dysphagia, and dysarthria. Furthermore, all patients with VCAP exhibited dysphagia. We therefore think that laryngofibroscopy should be performed in SCA1 patients with dysphagia as well as stridor.

The mechanism of VCAP may be divided into some types, the paralytic type, the non-paralytic type, and these two combined type. The first is possibly caused by loss of neurons in the nucleus ambiguus. The second is considered to be due to overactivity of the intrinsic laryngeal muscles. Stridor due to paralysis has been found to be more prominent in sleep than during wakefulness; whereas stridor by non-paralytic dysfunction has been found both during the daytime and during sleep. We suspect that the VCAP in patients with SCA1 may be dominantly paralytic, because the nucleus ambiguus is sometimes pathologically involved in SCA1 and because stridor in our patients with SCA1 was more marked in sleep.

Our laryngofibroscopic findings suggested that severe VCAP caused breathing difficulty on inspiration in the patients with SCA1 by obstructing the airway. Moreover, the stridor during wakefulness as well as sleep indicated it to be very serious. The important question concerns when tracheostomy should be carried out after the diagnosis of VCAP to prevent respiratory abnormalities leading to sudden death. Although we consider tracheostomy at the stage when breathing difficulty on inspiration or stridor during wakefulness is noted, it awaits further study with a large number of patients to decide which stage is best for tracheostomy.

Furthermore, we now consider endoscopic cord lateralisation as another possible management for VCAP.

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Brief summary of the clinical features and CAG repeat numbers in the patients with SCA1

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age/sex</th>
<th>Overt CAG*</th>
<th>Duration of illness</th>
<th>Disease</th>
<th>Stridor at night</th>
<th>Stridor during wakefulness</th>
<th>Dysphagia</th>
<th>Breathing difficulty</th>
<th>Tracheostomy</th>
<th>(CAG)n of mutant allele</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30/M</td>
<td>28/2</td>
<td>2</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>53</td>
</tr>
<tr>
<td>2</td>
<td>30/F</td>
<td>39/3</td>
<td>1</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>47</td>
</tr>
<tr>
<td>3</td>
<td>27/F</td>
<td>20/7</td>
<td>++</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>59</td>
</tr>
<tr>
<td>4</td>
<td>34/M</td>
<td>23/11</td>
<td>++</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>52</td>
</tr>
<tr>
<td>5</td>
<td>56/F</td>
<td>46/9</td>
<td>++</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>47</td>
</tr>
<tr>
<td>6</td>
<td>67/F</td>
<td>51/14</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>+</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>46</td>
</tr>
<tr>
<td>7</td>
<td>50/F</td>
<td>41/8</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>46</td>
</tr>
</tbody>
</table>

* (+)=normal; (+)=median position; (++)=paramidline position; (+++)=midline position.
Lateral gaze synkinesis on downward saccade attempts with paramedian thalamic and midbrain infarct

The symptoms of paramedian thalamic and midbrain infarct include ocular motor disturbances mainly in the vertical plane.7 We here describe a patient with the additional feature of an unusual horizontal eye movement synkinesis.

A 60 year old overweight man, with diabetes and mild hypertension, suddenly fell into a coma that lasted for 4 hours and was followed by slight right hemiparesis, recent memory impairment, hypersomnia, and vertical gaze impairment.

On admission to our centre, about 10 days after symptom onset, the patient still presented fluctuating drowsiness from which he could be easily aroused, normal cognitive functions with mild attention disturbance, slight right facial weakness, and mild incoordination at the finger-to-nose test with his right arm.

The most important findings involved ocular motor function. Both pupils were normal in diameter and reacted normally both to light and to convergence. The cover test did not disclose any eye misalignment. During attempted fixation, the patient showed saccade oscillations (usually square and macrosquare wave jerks)—that is, back to back involuntary horizontal saccades with an amplitude ranging from about 2 to about 10 degrees and with an intersaccadic interval of about 200 ms, that brought the eyes away from and back to the fixation point, at an approximate rate of three every 2 seconds. Clinical examination of eye movements in the horizontal plane and visually guided reflexive saccades recorded by the infrared reflection technique were both normal, whereas the amplitude range of vertical saccade and smooth pursuit eye movements covered only a few degrees of upward gaze. Vertical amplitude range was slightly greater for the vestibulo-ocular reflex in the pitch (yes-yes) plane. Moreover, when the patient attempted to make a downward saccade, he showed a gaze deviation to the left (figure). This synkinesis was more evident when the examiner lifted the patient's lids, thus preventing lid synkinesis during downgaze. Attempted upward saccades did not produce any horizontal gaze deviation. Finally, the patient showed normal Bell's phenomenon.

An EEG showed frontal, bilateral theta and theta/delta activity and sporadic hypersomnia, and MRI (figure) disclosed a bilateral thalamomesencephalic infarct which involved predominantly the right side.

Horizontal gaze deviation on attempted downward saccades disappeared about after 15 days, whereas vertical gaze impairment and hypersomnia were unchanged 1 year later. Subsequent polysomnographic testing disclosed sleep apnoea.

The clinical features of our patient are those reported for thalamic infarct involving the rostrointerstitial nucleus of the medial longitudinal fasciculus (riMLF). By contrast, the leftward gaze deviation elicited by the attempt to make a downward saccade is at variance with all previous descriptions.

The triggering of a saccade requires not only the activation of the excitatory burst neurons (EBNs), but also the deactivation of the omnipause neurons (OPNs), which provide tonic inhibition of both horizontal and vertical EBNs.

Accordingly, any attempt to activate a lesioned riMLF should be associated with maximal OPN inhibition. However, OPNs discharge for saccades in any direction and are not strictly direction selective, as shown by horizontal oscillations during vertical saccades detectable in normal subjects.7 These oscillations suggest that during vertical saccades the inhibition of OPNs disinhibits both vertical and, to a lesser extent, horizontal EBNs.

In our patient, the horizontal gaze deviation was always directed to the left rather than in both directions as during oscillations. Many ocular motor structures, including those located in the midbrain, trigger a purely vertical (downward) saccade only when stimulated bilaterally, so as to nullify horizontal components with different direction depending on the stimulation side. This probably occurs for the riMLF too, as it shows ipsilateral projections to the abducens nucleus.7 In our patient, the projections to the left nucleus were probably spared by the fact that the lesion predominantly affected the right side.

Overall, our patient's horizontal ocular motor synkinesis is unusual, and probably derives from a strong inhibition of OPNs, which in turn frees the horizontal EBNs, and from an unbalanced activation of the left abducens neurons via riMLF projections spared from the lesion, although it is not possible to exclude the possibility that the unbalanced activation of abducens neurons originated from frontal or parietal cortical areas or from the superior colliculus rather than from riMLF projections.

This hypothesis is strengthened by the reinforcement of the leftward eye deviation when the examiner kept the patient's lids lifted. Since this manoeuvre prevents lid synkinesis, it results in what resembles an attempted forced lid closure which, on the basis of blink induced eye oscillations,7 is likely to be an additional stimulus for OPN inhibition. Moreover, although they occur in various conditions, saccade oscillations during fixation are in keeping with a reduction of OPN inhibition level.7

In conclusion, our patient presented an ocular motor synkinesis that should be listed among those occurring in thalamomesencephalic infarcts. This sign is unusual and it is likely to be overlooked, but it is fully explicable both by neurophysiology and

(A) and (B) show a thalamomesencephalic ischaemic lesion, hyperintense in T2 weighted scans (SE, TR=2300 ms; TE=25 ms). The lesion involves the anteromedial portion of both thalami, but the right one to a larger extent. In the midbrain, the lesion is located around the Sylvian aqueduct, and symmetrically, but prevalently right sided, and involves the area that is located posteromedially with respect to both red nuclei. (C) Recording of the horizontal (upper tracing) and of the vertical (bottom tracing) movement recorded respectively from the left and right eye with the infrared reflection technique (Skalar, IRIS system) during an attempted downward saccade. The vertical tracing is flat, as the patient was unable to move his eyes downward. By contrast, the horizontal tracing shows a concomitant leftward saccade. At onset, both tracings show a blink artifact.
by anatomical connections of the saccade system.

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Botulinum toxin is a useful treatment in excessive drooling of saliva

Excessive drooling of saliva or hypersialorrhea is a common problem in neurodegenerative disorders such as motor neuron disease or Parkinson’s disease. It is usually caused by swallowing dysfunction and can facilitate choking, aspiration, and chest infections. Socially it is embarrassing and disabling. There are many treatment options: anticholinergic drugs are sometimes tried but are usually of little benefit and side effects (orthostatic hypotension, dizziness, and mental confusion, particularly in the elderly) limit their usefulness.

Occasionally, as a more drastic treatment irradiation of the parotid gland is carried out when hypersialorrhea becomes intractable.

Apart from its established usefulness in the treatment of focal hyperhidrosis of the palms, Botulinum toxin inhibits acetylcholine release in nerve terminals mainly at the neuromuscular junction, but also in sympathetic and parasympathetic ganglion cells and in postganglionic parasympathetic nerves, by blocking SNAP-25, a protein involved in the fusion of acetylcholine containing vesicles with the plasma membrane. Against this background we evaluated the usefulness of botulinum toxin injections into the parotid gland in four patients with excessive drooling of saliva with their consent.

One patient had young onset secondary generalised dystonia with severe mouth openings, one had advanced Parkinson’s disease, the third patient had progressive supranuclear palsy, and the fourth patient had motor neuron disease. Drooling in these patients was so severe that they had to wear a bib or carry a towel around their neck. With one exception 20 units of Dysport (Ipsen) were injected superficially subcutaneously above the angle of the mandible at the posterior margin of the masseter muscle, avoiding the bulk of the muscle. The shorter version (5/8") of the 25 gauge needle was used.

Because worsening of dysphagia was feared only 10 U Dysport were injected into each parotid gland in the patient with motor neuron disease. Drooling did not significantly improve in the patient injected due to the low dose of botulinum toxin used. He declined further treatment.

All the other patients had a beneficial response beginning by the end of the first week and lasting 6 weeks in one patient and 3 to 4 months in the others. Apart from subjective improvement reported by the patients and caregivers, reduction of drooling was demonstrated by the fact that the patients did not have to use a bib or towel. One patient had mild worsening of existing dysphagia.

Two patients had mild chewing difficulties, possibly due to diffusion of the toxin into the masseter and only one patient complained of a dry mouth. None developed facial weakness.

All three patients considered the response good enough and side effects sufficiently minimal for them to continue botulinum toxin treatment at regular intervals.

Injections of botulinum toxin into the parotid gland (and other salivary glands) may be an effective and simple treatment for excessive disabling drooling of saliva in selected patients.

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Extensive brain calcifications in systemic sclerosis: two cases

Systemic sclerosis (scleroderma) is a multisystem connective tissue disease of unknown aetiology, characterised by progressive fibrosis of the skin and internal organs including the lungs and gastrointestinal tract. Pathological calcification of soft tissues (Calcinosis cutis) is a common feature in the CREST syndrome of scleroderma (calcinosis, Raynaud’s phenomenon, osseous heteromatous dysplasia, sclerodactyly, telangiectasia). By contrast, internal organ calcification is rare, and isolated cases of spinal calcification and calcific constrictive pericarditis have been reported. We report here the cases of two patients with systemic sclerosis whose CT examination disclosed extensive brain calcifications.

Case 1, a 48 year old man was referred to hospital because of polyarthralgia involving the wrists and ankles, Raynaud’s phenomenon, chronic fatigue, asthenia and visual disturbances. Mental tests were normal. He had no history of myocardial infarction or cerebral infarction. Excessive disabling drooling of saliva in the patient’s wife had noticed that during the previous months, he had a slowed mentation and a depressive mood. Physical examination disclosed a sclerodactyly, telangiectasia and calcinosis. Routine haematological tests were normal. Antinuclear antibodies were positive at a 1/2000 dilution with nuclear fluorescence. Rheumatoid factors, antistrepsilid antibodes and antiphospholipid antibodies were negative. There was no cryoglobulinaemia. Complement was normal. Lumbar puncture tests showed a restrictive syndrome (forced vital capacity 75% predicted). Chest radiography was normal, and oesophagogastroscopy, ultrasonography and cranial ultrasonography were normal. A diagnosis of systemic sclerosis was made and the patient was given diltiazem (180 mg/day) and ketoprofene (150 mg/day).

Six months later the patient was admitted to hospital because of polyarthralgia involving the wrists and ankles, Raynaud’s phenomenon, asthenia and visual disturbances. Mental tests were normal. He had no history of myocardial infarction or cerebral infarction. Antinuclear antibodies were positive at a 1/2000 dilution with nuclear fluorescence. Rheumatoid factors, antistrepsilid antibodes and antiphospholipid antibodies were negative. There was no cryoglobulinaemia. Complement was normal. Lumbar puncture tests showed a restrictive syndrome (forced vital capacity 75% predicted). Chest radiography was normal, and oesophagogastroscopy, ultrasonography and cranial ultrasonography were normal. A diagnosis of systemic sclerosis was made and the patient was given diltiazem (180 mg/day) and ketoprofene (150 mg/day).

Six months later the patient’s mental status had worsened. He complained of memory loss, poor concentration, and insomnia. On neurological examination he was anxious and very slow in answering questions. Six months later the patient’s status had worsened. He complained of memory loss, poor concentration, and insomnia. On neurological examination he was anxious and very slow in answering questions.

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were noted. Telangiectasias were present on the face, hands, and palate. The patient complained of pyrosis. Oesophageal manometry showed abnormalities of oesophageal motility. Hand radiography disclosed soft tissue calcifications. Anticientromere antibodies were positive at a 1/1000 dilution. A CREST syndrome was diagnosed and the patient was given buflomedil (600 mg/day) and prednisone (25 mg/day).

One year later she was admitted for the evaluation of recent transient ischaemic attacks (TIAs). During the previous week she had experienced three bouts of expressive aphasia and right hemiplegia, each lasting about 10 minutes. She never smoked and did not have diabetes, hypertension, or dyslipidaemia. The neurological examination was normal. Routine blood chemical tests were normal (serum electrolytes, urea, creatinine) including phosphorus and calcium metabolism (serum parathyroid hormone concentration, blood calcium and phosphorus, 25-hydroxyvitamin D, 1,25-dihydroxyvitamin D, calcitriol, and phosphaturia). Cranial CT showed bilateral calcifications of the basal ganglia, and faint calcifications of the dentate nuclei and rubro nucleus. Moderate cerebral and cerebellar atrophy was noted. Duplex carotid ultrasound and 24 hour ECG recording were normal. Echocardiography showed a normal left ventricle with an ejection fraction of 60%. There was mild calcification and a thickening of the mitral valve leaflets. Aspirin (250 mg daily) was given at hospital discharge. No further TIA occurred during a 5 year follow up and the patient’s clinical status has remained unchanged. 

Systemic sclerosis is a multisystem disease predominantly affecting the skin, lungs, vascular system, and gastrointestinal tract. 

Neurological involvement occurs in a few patients (ranging from 0.8 to 18.5%) including cranial nerve abnormalities, peripheral neuropathy, CNS vasculitis, and autonomic peripheral neuropathy. To our knowledge, extensive cerebral calcifications have not yet been reported.

Calcification of the brain is discovered in 0.8 to 1.2% of subjects undergoing routine CT examination, mainly in the globus pallidus. In most cases the deposits are small and involve older patients who remain asymptomatic, leading to the concept of “physiological” senescent basal ganglia calcifications. On the other hand, basal ganglia calcifications, often associated with dentate nuclei calcifications, have been reported in more than 30 conditions, including abnormalities of calcium phosphorus metabolism such as pseudohypoparathyroidism. Systemic sclerosis leads to the formation of calcium deposits in the subcutaneous tissue. Rarely, the calcific process has been shown to involve the spine or pericardium. Recently, Heron et al described two cases of cerebral involvement in systemic sclerosis. In both cases necropsy showed extensive wall calcification of the small arteries and arterioles of the brain. Our two patients have scleroderma and extensive striopallidodentate calcifications and metabolic investigations failed to disclose any specific aetiology in either case. We think that scleroderma should be added to the list of conditions described as occurring with basal ganglia calcification. 

The pathogenesis of the formation of calcium deposits in systemic diseases remains poorly understood. However, pathological calcification can be subdivided into meta -static (occurring in undamaged tissues when extracellular calcium and phosphate concentrations are increased) and dystrophic (occurring in injured tissue when extracellular calcium and phosphate concentrations are normal) calcification. In our patients, as in the patients of Heron et al, the brain calcifying process may be related to primary cerebrovascular changes induced by systemic sclerosis. Routine brain CT examination in systemic sclerosis could help to determine the true incidence of basal ganglia calcifications and their clinical relevance.


CORRESPONDENCE

All tibial foot: an electrophysiological artifact

Yamashita et al claim they have proved an “all tibial foot” for the motor innervation, an anomalous dual innervation of the tibialis anterior muscle by the deep peroneal and posterior tibial nerve, and a sensory reinnervation of the skin between the first and second toes by the tibial and deep peroneal nerve in a patient. To support their view they quote the letters of Linden and Berli6 and of Glocker et al, ignoring our letter5 and that of Magistris and Truffer1, both considering the conclusions of Linden and Berli6 and Glocker et al to be wrong. I point out that the mentioned letter of Linden and Berli6 and our response to it were published in the same issue.

We have recorded a compound muscle action potential (CMAP) with a negative initial deflection on tibial nerve stimulation in 83% of 50 subjects, using a surface electrode over the extensor digitorum brevis. In the same subjects no potential was recorded by means of a concentric needle electrode inserted in the extensor digitorum brevis.1 In our view, this proves that the CMAP recorded by surface electrode over the extensor digitorum brevis on tibial nerve stimulation is a remote potential originated in the plantar muscles (volume conducted potential). Furthermore, we consider that the CMAP recorded over the tibialis anterior muscle by surface electrode on tibial nerve stimulation in the popliteal fossa, as reported by Yamashita et al,1 represents a volume conduction potential originating in the foot and toe flexors. The sensory nerve action potential recorded dorsally in the space between the first and the second toes on tibial nerve stimulation could also be a volume conducted potential originating in the first common plantar digital nerve, as the distance between this nerve and the recording electrode is short. Such volume conduction phenomena are known to occur on surface recordings from the median nerve at the wrist in severe carpal tunnel syndrome, when the forth finger is stimulated. It is unclear why Linden and Berli6 and Glocker et al1 ignored our letter5 and that of Magistris and Truffer1, both considering the conclusions of Linden and Berli6 and Glocker et al to be wrong. I point out that the mentioned letter of Linden and Berli6 and our response to it were published in the same issue.
 appropriate examination would have been a needle EMG of the extensor digitorum brevis.

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BOOK REVIEWS


If it moves - measure it. Such is the trend in psychiatry and this has led to a proliferation of assessment scales of variable utility; from the esoteric to the ubiquitous. This book has the advantage of brevity, and is genuinely, one of the most useful volumes I have seen for a very long time. It covers everything from the AMTS through the MMSE to the KEG cognitive test. Each scale is presented in full together with a short commentary, critical references and, usefully, an estimated time taken to perform the test together with an address to contact the original author. The scales presented are divided into those covering depression, neuropsychiatric assessments, activities of daily living, global assessments, visible assessments, delirium, caregiver assessments and scales for memory function. This organisation, together with a useful and functional index, will make the task of selecting an appropriate scale much easier in the future. Some of these scales are covered by patent law and my only quibble is that it would have been useful to know which instruments can be reproduced and for what purpose without fear of being billed for the privilege. Maybe highlighting such information would give unpatriotted authors a stimulus to share their lawyer and therefore increase this deplorable practice.

This aside, I cannot recommend this book highly enough. By contrast with books that come highly recommended in diverse reviews but remain pristine on your library shelf, if you are ever fortunate enough to get hold of this volume from your institution library then you will, I guarantee, find it well thumbed. For academics, the book is a prayer answered and will become an essential resource, the planning and execution of any clinical research. For clinicians, psychologists, occupational therapists, and other members of the multidisciplinary old age psychiatry team, the collection of so many scales covering all aspects of mental health of elderly people should encourage the use of valid and reliable assessment procedures to enhance rather than detract from good clinical practice. My only question is "Why didn't somebody do this before".

RODNEY LAING


My first sensation is that such a book is long overdue. There is a paucity of books written by clinicians on this subject compared with the many gloom and doom tracts written by sufferers who have apparently been ill with CFS/PVS/ME for 20 years and which depress the hell out of the patients that I see. Why this lack? Undoubtedly because relatively few doctors want to put their heads above the parapet and profess to a great expertise or desire to see patients with it. It is a condition for which there is no objective test, no objective monitoring of progress, whose symptoms are so vague that they repeatedly defy classification and can only be catalogued. Among those patients with a genuine postinfectious fatigue (who mainly get better relatively quickly), the majority of those with hospital records measured by the kilogram who arrive with sheaves of self-complied additional notes and occupy huge periods in the clinic to little effect other than frustration for both doctor and patient. Why do they this is a different story.

So what about the book? Firstly I must say it comes armoured plated against criticism with a pack of glowing references from ensembled and famous physicians on the back. Presumably the authors chose these referees whose major feature in common is distinction in fields other than chronic fatigue syndrome. So, for whatever reason they were chosen the result is also to make this a poisoned chalice to review if one has the temerity to disagree with such a company.

Chronic fatigue and its Syndromes is written by three psychiatrists. That in itself is little odd as although psychiatric illness is quite common in the chronic fatigue syndrome group, most patients with chronic fatigue syndrome are very reluctant to be seen on first presentation by psychiatrists. One usually has to assure them that one is not dismissing their symptoms as psychiatric if one does suggest such a referral. What proportion of patients I wonder go to psychiatrists as their first hospital referral? I would guess very few.

The book is very comprehensive. As a source of references on the subject of fatigue it is encyclopaedic. It begins with a nice history of the syndrome. Of a 428 page book nearly all pages cover assessment of the patient and a very telling paltry 14 are devoted to treatment. What is all the rest? The answer is that the authors have attempted to deal with every fatigue associated subject including: aetiology of chronic fatigue syndrome (summary - not known) and in a move which Sir Humphrey Appleby might have described as “courageous” they have ventured way outside their own area of expertise into subjects such as viral and immune. The result is a collection of comprehensively referenced and uncritically selected facts from the literature, many of which are very useful, such as the collected data on entero- viral and chronic fatigue syndromes, much of which is of uncertain value—for example, “divorced and separated women have higher titres of EBV-VCA antibodies” quoted out of context but not unrepresentatively. To glean interesting and important information from this book requires a fair degree of skill in distinguishing timber from forest.

When in their own field of psychiatry there is, unsurprisingly, a much more confident and informative air to the book. It is...
disappointing and somewhat introspective that they do not think that subjects such as neurobiology, microbiology, and immunology might justify equally expert contributors.

Is it an easy read? There is no easy way to write on a subject such as this, bedevilled by lack of objective facts and the writers have chosen a discursive, debating style which when not tightly controlled can slip towards verbosity. This, however, is not a standard medical text book and it would be unfair to make direct comparisons.

Is this a useful book? As a source of references, yes. As a guide to clinicians I am less convinced. The two commonest questions publicly and privately mentioned: “How long does the illness last?” and “What are my chances of recovery?” Cognitive behavioural therapy is concisely and usefully summarised. There is a single page on complementary treatment, which again is often an area of considerable interest to patients notwithstanding the lack of controlled evidence for or against it.

On that note it is perhaps appropriate to quote one very intelligent patient with chronic migraine whom I saw who became ill during his PhD. “I’ve done a lot of reading and internet searching about the causes and possible cures of this, before I came to see you” he said “It seems to me that most people have only a bit of that which you commonly see after glandular fever and nobody seems to think it odd that after glandular fever you can feel unwell for quite a long time.” I continued “If most people get better from this” (and many do) and if you try all sorts of other treatments like homoeopathy, acupuncture, meditation then the one you were doing when you got better will be the one you can claim cured you”. He had of course discovered the maxim of entertaining the patient while nature gets them better. One context discovered the maxim of entertaining the patient while nature gets them better. One course discovered the maxim of entertaining the patient while nature gets them better. One context discovered the maxim of entertaining the patient while nature gets them better. One context discovered the maxim of entertaining the patient while nature gets them better. The book is up to date, containing many 1998 references. Another strong point of the book is its comprehensiveness; though only 184 pages long, it covers every major aspect of the pathophysiology of migraine. There are chapters on cranial blood vessels, receptor physiology, neurotransmitters, 5-hydroxytryptamine receptor subtypes, cortical spreading, depression, neurogenic inflammation, and numerous shunts, cerebral haemodynamics, and animal modelling. This is achieved at the expense of some pretty terse prose at times, which can make it difficult for the non-expert to follow. It should be noted that, the title notwithstanding this book deals almost exclusively with the pathophysiology of migraine, and the reader who buys it to get some insight into the mechanisms of tension-type headaches, or other kinds of headache, is going to be disappointed.

Who should read this book? Certainly the migraine research should. Though much of it will be familiar to those who have kept up with the literature, it is nevertheless an attractive and handy compendium of current research information. Moreover, the first chapter (by Lars Edvinsson) and the last chapter (by Peter Goadsby) are very pretty syntheses of the field. What about clinicians? Some of it is heavy going for people like me, who are not basic scientists. But I got through it all in about six hours, and found I knew more about migraine coming out than I did going in—which makes reading it a very worthwhile exercise.

JOHN EDMEADS


There is something about the anarchistic binding of the Handbook of Clinical Neurology series that is rather reassuring. Surely if classic phenomenological neurology is to be found anywhere, it will be between these fake leather embossed covers. This volume, the second of three on the neurology of systemic diseases, does not disappoint. Here, in 450 pages of close type and few illustrations, are covered the neurology of orthopaediac, endocrine, gastrointestinal and psychiatric disorders. Goetz and Aminoff, the volume editors, have assembled an authoritative panel of authors that equitably straddle the Atlantic. There are detailed reviews of familiar territory such as diabetes, orthopaediac trauma, thyroid diseases, and porphyria. Cole’s historical survey of B12 deficiency is particularly fine. In addition there are excellent chapters on more arcane topics for instance the neurology of pancreatic transplantation and intestinal pseudo-obstruction. Perhaps the movement disorders associated with coeliac disease could have been mentioned and a chapter on the neurology of inflammatory bowel disorders is certainly lacking. But these are trifling complaints against a text that, with its twin volumes, is significantly more comprehensive than any other account of the neurology of systemic diseases. It is hard to imagine a practicing neurologist requiring (or easily affording) a personal copy of all three volumes, but the local medical library should certainly buy them; both neurologists and general practitioners will work the better for having them close to hand.

ANDREW LEVER


New information about how and why migraine happens continues to break on us in a dizzying succession of waves coming from various journals in different disciplines. We need an accessible, understandable, and unified vehicle to collect, organise, and present this information. Journals, the Internet, and the abstracting services have their place, but for this purpose nothing beats the book. How well does Lars Edvinsson’s Migraine and Headache Pathophysiology meet this need? This book has several attractive features. Recognising that some of the world’s best science is now being done in the laboratories of industry, it has enlisted as authors several leading researchers from the major pharmaceutical manufacturing companies, in addition to “the usual suspects” from academe. Not only has this introduced some exciting writers to the “review book” audience, but it has provided a particular insight into the science of determining why drugs work, or don’t work, in migraine. The book is up to date, containing many 1998 references. Another strong point of the book is its comprehensiveness; though only 184 pages long, it covers every major aspect of the pathophysiology of migraine. There are chapters on cranial blood vessels, receptor physiology, neurotransmitters, 5-hydroxytryptamine receptor subtypes, cortical spreading, depression, neurogenic inflammation, and numerous shunts, cerebral haemodynamics, and animal modelling. This is achieved at the expense of some pretty terse prose at times, which can make it difficult for the non-expert to follow. It should be noted that, the title notwithstanding this book deals almost exclusively with the pathophysiology of migraine, and the reader who buys it to get some insight into the mechanisms of tension-type headaches, or other kinds of headache, is going to be disappointed.

ALASTAIR COLES


Advances and Technical Standards In Neurosurgery is sponsored by the European Association of Neurosurgical Societies. The intention is to publish reviews of topics in which recent advances have been made, and to invite acknowledged experts to present in depth accounts of established knowledge in various fields of neurosurgery. The advances under review in this volume are the contribution of the septal region to memory, the in vivo metabolic investigation of cerebral gliomas with PET, and the use of image guidance in neurosurgery. In the technical standards section, Professors Van Aalst and Y asargil discuss the endovascular treatment of arteriovenous malformations, Dr Guglielmi reports on the interventional neuroradiological treatment of intracranial aneurysms, and Dr Stussman and colleagues describe the management of benign intracranial hypertension.

This book is aimed primarily at young neurosurgeons, but is an excellent source of reference for those who are already trained. The fact that it is in its 24th volume is a testament to its success in achieving this objective.

ROBERT MACFARLANE


It seems that there is a new specialty in North American neurology, hospitalist neurology. The drive to promote managed health care has apparently resulted in hospitals “filled to overflowing with more acutely ill patients requiring a pace of evaluation unprecedented anywhere in the world”. Even the hospitalist, a neurologist. Unencumbered by the duties of outpatient neurology, he or she stumbles through the wards of the general hospital “faced with a dizzying array of neurologic problems”. Most British neurologists have a ward referral practice and will not be impressed by its elevation to the status of a specialty and still less by the agrammatical title Martin Samuels has chosen for it. Which is a shame, because this book deserves a wide readership. One in the Butterworth Heinemann series of Blue Books of Practical Neurology, it is attractively produced and reasonably well illustrated. Its place on your bookshelf is earned by collating the neurologic aspects of diverse medical specialties: to name a few, organ transplantation, orthopaedics, oncocology, and urology. A quick glance here before a ward referral might well be rewarding. However, the chapters on more conventional neurological topics, such as neuro-ophthalmology, stroke, and seizures are probably briefer than most neurologists would require. So, for those made dizzy by the delirious patient after bypass, the encephalopathic flapping on the transplant ward, or the weak and wasted on intensive care units, this is for you. And remember: you are a hospitalist neurologist.

ALASTAIR COLES
This is one of a new type of medical textbook written to meet the needs of an increasingly informed patient population. Aimed very much at those with multiple sclerosis, their families, and care-workers, it is simple and clearly written with jargon and technical terms kept to a minimum but without patronising. Chronic diseases, and especially multiple sclerosis, are not always well managed by the physician. Too many of us think that there is no cure and feel helpless in a busy clinic faced with the patient with a long list of complaints. There are too few specialty multiple sclerosis clinics in which neurologists, pain specialists, uro-neurologists, physiotherapists etc liaise.

Patients often feel left in the dark, unaware which of their symptoms can be attributed to their multiple sclerosis and whether it is “worth bothering a busy doctor”. Many can cite bad experiences in their past when they have been fobbed off with well meaning reassurance but without practical help. Dyseaesthesia, sexual problems, and urinary incontinence are only a few of the symptoms that can bring misery to the lives of patients and their families and which are poorly addressed by doctors. This book, in a language accessible to most (and with a glossary to explain some unavoidable jargon), explains multiple sclerosis, its symptoms, and what might realistically be obtained in terms of symptom control. All aspects are covered and nothing considered too trivial; constipation or cold feet might be extremely trying for an individual patient and each is considered.

The old idea that it doesn’t help a patient to know too much about his disease (“it will only make him introspective and hypochondrial”) is outdated. Multiple sclerosis can hit anyone and patients now want, and deserve, to be informed. While doctors find it challenging to be faced with a patient equipped with the latest information down loaded from the internet or well informed having read a book such as this, this is a challenge to which we must be ready to rise. This textbook provides the information patients want and fills the gap left by busy doctors. It should be marketed appropriately and we must be ready to respond to the reaction of patients. Perhaps someone with multiple sclerosis should have been invited to write this review.

GILLIAN HALL


(A) T1 weighted MRI of the lesion. (B) Anatomical scheme of the centre of the lesion, corresponding to the leftmost image of the bottom row of the MRI. The right side of the figures corresponds to the left side of the brain. GP=globus pallidus; Cd=caudate nucleus; Acb=nucleus accumbens; CI=capsula interna; DB=diagonal band.
Catatonia due to central pontine and extrapontine myelinolysis: case report

JULIO CHALELA and JORGE KATTAH

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