A PATIENT THAT CHANGED MY PRACTICE

In a worsening situation treatment can do more

A long time ago, at the Salpêtrière hospital in Paris, I was involved as 'Chef de Clinique' (roughly similar to a senior resident) in the management of a patient whose story has not only greatly modified my own practice, but also that of many neurologists in that famous institution.

THE STORY

The patient was a 69-year-old right-handed woman, a good tennis player, with no relevant past medical history, who had woken up on 12 December 1975 with a weak right arm. She was admitted a few hours later. She was conscious, but slightly apathetic. She had a dense right brachial monoplegia and a right extensor plantar response. The rest of the neurological examination was normal, in particular there was no facial or leg weakness, no dysphasia, no sensory disturbance and no papilloedema. General examination, temperature, and routine blood tests were all normal. Blood pressure was 145/85. Electrocardiogram was normal.

At that time there was no CT scan in the hospital and so we did the investigations available. An EEG showed delta wave activity over the left

rolandic region. At lumbar puncture, the CSF protein was 76 mg/100 mL and the red cell count 9000 per cu mm (at the time the pressure was not measured). The white cell count and glucose were normal. A radio-isotope brain scan showed increased uptake in the left fronto-rolandic region, which appeared triangular when viewed from the front. The tentative diagnosis was cerebral infarction, despite the absence of vascular risk factors and any obvious cause. She was given treatment, which was routine in our institution at the time: oral glycerin and dexamethasone.

Over the next few days, instead of improving as expected after a minor stroke, the patient gradually deteriorated with an extension of the deficit first to the face and then to the leg. Within a week, she had a dense right hemiplegia and started to complain of mild diffuse headache. The optic discs remained normal. She became dysphasic and increasingly apathetic. We then decided that she probably had a mass lesion such as a malignant tumour or an abscess. However, cerebral angiography was performed and interpreted as normal. The patient continued to deteriorate and on 16 December she became comatose.

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tion, ore good than harm

I had discussed matters several times with the patient's husband, a very nice old man. I had first explained that his wife had had a stroke and would probably recover very well, then that she had not had a stroke but possibly a tumour or an abscess, and then that the results of the angiogram did not fit with either of these diagnoses, so that we did not really know what the problem was, but that it was obviously very serious as his wife was in coma.

Meanwhile, the case had been discussed with many neurologists without any new ideas emerging. I showed the case to the neurosurgeons, but they didn't want to operate because there was no mass lesion on angiography. One of them said that surgery could even be dangerous if this was a cerebral venous thrombosis (CVT). I must confess that I had never seen a case of CVT and had hardly even heard of it!

I went back to the neuroradiologists who looked again at the angiogram and they found some subtle venous changes compatible with, but not typical of CVT. There was a small filling defect in the superior sagittal sinus and a small area of absent vascularization in the fronto-rolandic region during the capillary-venous phase (Fig. 1).

Figure 1 Left carotid catheter angiogram, venous phase: small avascular area (arrows) in the fronto-rolandic region adjacent to the superior sagittal sinus.

'My wife has been getting worse
and worse over the last 3 weeks,
she is now in deep coma, she is
going to die, I want to take the risk.
Please put her on heparin'.

I then went to the library and found that there were very divergent opinions about CVT. The classical view was that it was a very rare condition, usually of infective origin, and mostly involving the superior sagittal sinus causing bilateral or alternating signs including seizures and frequently leading to death because of haemorrhagic infarction. This haemorrhagic infarction was said to contra-indicate the use of heparin (Garcin & Pestel 1949; Barnett & Hyland 1953). There were, however, some divergent opinions and anticoagulants were firmly advocated by Krabenbühl (Krabenbühl 1967), and Kalbag and Woolf (Kalbag & Woolf 1967).

Although our patient had no infection, no seizures and purely unilateral signs, the idea of CVT was further considered but the prevailing opinion among the senior neurologists was that heparin would probably be too dangerous. This was the situation on the morning of 31 December 1975. So I had to explain to the poor patient's husband that we had a new diagnosis, CVT, that there was potentially a treatment, but that this treatment could be very dangerous. The man immediately replied: 'Look, I had a venous thrombosis in my leg some years ago, I was given heparin and I did very well. Why don't you give heparin to my wife?' I replied that this had been discussed but was thought to be too dangerous because it could worsen the haemorrhage that she probably already had. He replied: 'My wife has been getting worse and worse over the last 3 weeks, she is now in deep coma, she is going to die, I want to take the risk. Please put her on heparin'. He had convinced us! We stopped the dexamethasone and gave a first injection of heparin calcium (15 000 IU) on 31 December at noon and a second injection at midnight.

I was on duty on the 1st of January 1976 and when I arrived at the door of the ward, the husband was already there waiting for me. He nearly kissed me and said: 'She is awake'. I couldn't believe it, but it was true. Although still drowsy, she was no longer in coma. Over the next few days, she made a dramatic improvement. Within 10 days she was fully conscious, had no dysphasia and could walk without support. By day 20 after starting treatment, she was back to the situation at entry: a dense right brachial monoplegia. The husband asked us about the possibility of improvement, which was so important for this still very good tennis player. We said that recovery was unlikely because she had had the dense paralysis of the right arm for 6 weeks (3 weeks before and 3 weeks after treatment). But the very next day, the patient started to move her arm and within two weeks she completely recovered and was able to leave hospital, taking oral anticoagulants. A month later, she was able to play tennis again. No cause for the CVT was ever found, even after 10 years follow-up.

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LESSONS LEARNED

I learned many lessons from this patient:

- When a patient is a diagnostic mystery, the case should be discussed with other doctors or referred to colleagues, particularly when there is deterioration. They may have an idea that you don't.
- We see only what we look for. The angiogram was interpreted as normal by a number of excellent neurologists, neuroradiologists and neurosurgeons. It was only after the possibility of CVT was raised that subtle changes in the venous phase were seen.
- Any medical literature (classical as well as contemporary) should be read critically and the conclusions eventually challenged. However, it can be difficult to radically depart from the classical view. I reported this case briefly in a letter in 1977 (Castaigne *et al.* 1977) with two senior neurologists and, although we were convinced that heparin had been effective, we were still very cautious and wrote that, 'If patients with superior sagittal sinus and/or cortical vein thrombosis deteriorate despite antioedema measures and anticonvulsants, heparin should then be used'. In the following years, I saw other patients with CVT and gave heparin to all of them. This is what we have been advocating ever since.
- We must be aware that the words we use may be misleading. In CVT everybody uses the term 'venous infarct'. Unconsciously, we apply to this infarct what we know from the much more frequent arterial infarct. This is one of the reasons why heparin was so long thought to be contraindicated and this is also why we were so surprised by the dramatic recovery that occurred in our patient, which was unlike that of any arterial infarct. Recent MRI diffusion studies have indeed shown that the diffusion pattern of the so-called 'venous infarct' is very different from that of arterial infarcts, with frequently unchanged or even increased diffusion (Ducreux *et al.* 2001). Furthermore, even when the diffusion is decreased, there is much greater potential for recovery than in arterial infarcts.
- The principle 'do no harm' is crucial in medicine but, sometimes, one does harm by doing nothing. When in a given condition there are two therapeutic options, no treatment or a potentially dangerous treatment, it is reasonable to start with no treatment, but if the patient worsens, one should then take the risk of the other therapeutic option. In such a case, this should be discussed with the patient and/or the family, not only for medico-legal reasons, but also for psychological reasons and because the patient and family may well make the right decision. Indeed, in our case, the patient's husband was definitely right in insisting on heparin.
- If, as a young doctor you meet an unusual case, it is well worth working on the case, reviewing the whole literature, and collecting similar cases. You might then become a world expert in the field! This is what happened to me with CVT. Since 1975, I have collected 250 cases, written many papers and published a book on this topic (Bousser & Ross Russell 1997). It has been very rewarding because, with the development of neuroimaging, more and more cases have been diagnosed and treated early, with an excellent prognosis in the majority.