Functional integrity of the structural unaffected left hemisphere in crossed aphasia

We would like to comment on the article by Cappa et al in which a PET study on crossed aphasia was reported. The authors state: "Neither CT scanning nor MRI can exclude the presence of a left hemispheric functional impairment. Functional imaging methods, such as single photon emission computed tomography (SPECT) and positron emission tomography (PET), have been used in a handful of cases to assess regional cerebral blood flow and metabolism in patients with crossed aphasia. In their two patients, PET scan has shown a functional depression of both hemispheres in the acute stage. Their report is particularly interesting as they suggest that, in the acute stage of a crossed aphasia, only PET can provide information on the functional state of the structurally unaffected left hemisphere; one of the conclusions is that such a functional impairment of the left hemisphere may play an important role in the development of language disturbances in crossed aphasia, thus suggesting a bimemetic representation of language in these patients.

We have some remarks about the authors' results: (1) as reported by the authors themselves, the first patient was unfortunately not age matched with the control group and was 79 years old; it has been recently shown that cerebral oxidative metabolism decreases with aging. (2) In the first patient, hypometabolism in the left hemisphere was mild compared with the marked crossed cerebellar diaschisis. (3) In the second patient, the bilateral improvement of metabolism on the second PET examination did not really help to distinguish the crucial site responsible for language disturbances.

Regarding the assessment of the functional condition of the left hemisphere, our two cases of crossed aphasia previously reported showed abnormalities in standard EEG and quantified EEG (QEEG) that presented a good relationship with CT and MRI findings, suggesting a functional integrity of the left hemisphere. "Aphasia is usually related to cortical-subcortical lesions and, in these cases, EEG and QEEG have a good sensitivity and specificity in detecting abnormalities in the affected hemisphere, as well as in more widespread diseases." We thus consider our finding of a functional integrity of the left hemisphere assessed by EEG and QEEG to be correct.

We believe the discrepancy between our findings and those of Cappa et al is due to the extreme complexity in the physiopathology of crossed aphasia and to the uncertain knowledge, as yet, about brain lateralization of language in these patients.

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Cappa et al reply:
Dr Bandini and Primavera point to a discrepancy between our findings of reduced glucose metabolism in the left hemisphere of two patients with crossed aphasia, and their own results of normal EEG activity in the unaffected hemisphere of right-handed patients with language disturbances and right hemisphere pathology.

As a general comment, we think that a direct comparison of EEG findings with measurements of local metabolism and blood flow is probably unwarranted, given the differences between the methods. It is noteworthy, that in a recent review devoted to transcallosal diaschisis, Andrews concluded that the data on contralateral electrical activity in the acute period after a unilateral lesion were "inconsistent", while blood flow and metabolism showed a consistent decrease, followed by gradual return to baseline.

Considering Bandini and Primavera's specific remarks: (1) Case 1 was not age matched with the control group. We consider it to be unlikely that this age difference played a crucial role in the comparison. Although oxygen consumption decreases slightly with normal aging, some studies have confirmed the lack of a significant decline in absolute values of glucose consumption (see, for example, ref 3). In any case, it must be underlined that the reductions in our patient were in the 30-50% range in comparison with control values. (2) A direct quantitative comparison between crossed cerebellar and transcallosal diaschisis is of limited interest, given the present uncertainty about the mechanisms underlying these phenomena. Both findings are well documented in the medical literature on PET. The increase of metabolism is needed bilateral, as clearly indicated by the lack of interaction in analytical variance. This finding is in agreement with the participation of the transcallosal hemisphere in the early phase of recovery, both in patients with "standard" aphasia and in patients with atypical language dominance. Our specific hypothesis, that the latter patients may be more liable to remote effects of focal lesions, remains open to further investigation.

In conclusion, we think that the differences between our report and Bandini and Primavera's findings are mainly due to the different methods. The subject of crossed aphasia, as well as of other instances of atypical cerebral dominance, is far from being completely understood, and remains a crucial research area for the understanding of the neural correlates of cognitive functions.

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**BOOK REVIEWS**

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**Brain's Disease of the Nervous System**

When the first edition of Brain's, "Diseases of the Nervous System" was published in 1933, its initial reception did not suggest a long life expectation; and yet now a review of the tenth edition is invited, some 60 years later.

The book was first reviewed in "Brain", and although the piece was unsigned, the somewhat acerbic style is still recognisable. Several of the points made in the review can be considered in assessing the later and this, the latest edition.

"The crux of the medical writer's problem today is not what he is to include but what he should omit . . . it is a defect of some modern textbooks that their authors have never formulated their problem in these terms and have left it obscure as to whom they wish to reach."

Lord Walton maintains in his preface,

Historical problems in frontal lobe research have included a tendency to expect the whole of the frontal lobes (nearly half the hemispheres) to have a single function, and a parallel tendency to try to delineate one characteristic clinical frontal lobe syndrome. There has been a tendency to over-simplify regard for the immense connectivity of frontal cortex with other cortical areas and with subcortical areas, where lesions can produce the symptoms of a "frontal" syndrome. It is misleading to define "frontalism" on the basis of one or a few clinical tests such as the Wisconsin Card Sorting test, and a clear distinction must be preserved between the functional and the anatomical level of analysis. This excellent book, which summarizes much recent thinking on the subject, demonstrates that further understanding of the frontal lobes will involve the more refined taxonomy of functions and secondly a neuroanatomical and neurophysiological mapping of specific functions.

Among Diamond's dicta are (1) use more than one task linked to a given neural substrate (convergent validity); (2) study the role of other neural regions in the same tasks (divergent validity); and study other tasks linked to the frontal regions; (3) use the same tasks when comparing populations rather than ones which are merely similar; (4) use the same performance (why does the patient fail)?

There is evidently a long way to go before these ideals are attained.

After Benton's useful historical introduction to the prefrontal region the first part of the book discusses anatomy, supporting Damasio's claim, in a stimulating epilogue, that progress in this area will depend in great degree on a better understanding of connectivity.

Subsequent sections cover clinical aspects of cognition; motor function (with a useful and provocative clinical chapter on this topic by Heilman and Watson); behaviour; development; and rehabilitation. The arrangement sometimes seems a little arbitrary. Although there is a section on integration of experimental studies with clinical data, a fuller impression of how anatomical and physiological and behavioural studies in primates relate to humans comes from reading the book as a whole. In contrast to most multi-author books, this one retains a sufficient consistency of concepts and terminology to be largely intelligible as a continuous text.

Has the recent evolution of the frontal lobes led to a qualitative rather than merely quantitative departure from simple stimulus-response models of cerebral function? Did our frontal lobes liberate us from automatic behaviour, enabling us to do many of the alternatives on this side of the Atlantic. Now with a shared authorship, future editions will be assured.

J B FOSTER


This is another made easy book for medical students and it makes neurological examination far more complex than it actually is. It starts with an assumption that neurological examination can be as 'screening tool' or as 'investigative tool'. I think the final neurological examination that forms the basis of the practice of medicine rather than a 'tool'.

The language used is simple and the illustrations useful. In particular the figures used for demonstrating the sensory loss with use of small sections of spinal cord is a good idea and does convey useful information. The figures for abnormalities of the optic fundus, however, are confusing and I think colour pictures rather than line drawings make a better impact. There is an attempt to fit most of the examination findings in a form of flow chart, and the title for each is 'simplified approach'. I think makes it complicated and there are still difficulties when you try to fit patients in flow diagrams.

Power testing and grading can always be controversial. MRC grades were wanted to largely to record power in polymyelitis tri- als and research. For the clinician a good description as to what the patient can and can not do with a particular muscle is far more relevant. Medicine taught neurological examination should learn to do just that rather than giving a 'number' to the weakness. This apart, the book flows very well and certainly can be recommended to students of medicine.

ATUL BINWALE


Most of the major symptoms in old age have a neurological component—unsteadiness, falls, intellectual impairment, incontinence. Though physical dependence is commonly caused by neurological disease it is not always recognised that much can be usefully be done by way of preventative measures, early treatment and rehabilitation. The book aims to outline the principles and provide practical guidance for the undergraduate and younger doctor dealing with neurological...