

Functional integrity of the structural unaffected left hemisphere in crossed aphasia

We would like to comment on the article by Cappa *et al*¹ 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 bihemispheric 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 (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.^{3,4} 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,⁵⁻⁸ as well as in more widespread diseases.⁹ 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*¹ is due to the extreme complexity in the physiopathology of crossed aphasia and to the uncertain knowledge, as yet, about brain lateralisation of language in these patients.

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Cappa *et al* reply:

Drs 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 hemispheric 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 transcalsal diaschisis, Andrews¹ concluded that the data on contralateral electrical activity in the acute period after a unilateral lesion were "inconclusive", 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,² several 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 transcalsal diaschisis is of limited interest, given the present uncertainty about the mechanisms underlying these phenomena.⁴ Both findings are well documented in the medical literature on PET.^{5,6} (3) The increase of metabolism is needed bilateral, as clearly indicated by the lack of interaction in analysis of variance. This finding is in agreement with the participation of the contralateral 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

All titles reviewed here are available from the BMJ Bookshop, PO Box 295, London WC1H 9TE. Prices include postage in the United Kingdom and for members of the British Forces Overseas, but overseas customers should add £2 per item for postage and packing. Payment can be made by cheque in sterling drawn on a United Kingdom bank, or by credit card (Mastercard, Visa or American Express) stating card number, expiry date, and your full name.

Brain's Disease of the Nervous System/ 10th Edition. Edited by JOHN WALTON. (Pp 801, Price: £95.00) 1993. Oxford University Press. ISBN 019-261969-1.

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,

problems in elderly patients.

The scope is wide, including sleep disorders, thermoregulation, pain, depression, visual and hearing difficulties, the problems of family supporters and living wills. Those common but poorly understood neurological problems such as cramp, neck pain and incontinence are dealt with honestly. The chapter on how to interview patients is excellent, though the central importance of the telephone in history taking is overlooked. I would have liked more detail on the physical examination, especially on how to observe an older person standing, walking, turning and sitting—assessments often missing from medical case notes. The emphasis on foot problems and footwear is a welcome inclusion.

The book is liberally illustrated with MRI pictures. There are copious up-to-date references, from Europe as well as North America. The writing style is lucid and the many contributors give down-to-earth advice based on published data. In many cases, we have no facts to help direct our treatment; where there is ignorance or controversy, sensible guidelines are offered.

There are important gaps: agnosia and apraxia are overlooked and visual hallucinations are poorly covered. The elderly driver get only a few lines. There is relatively little on rehabilitation. I was surprised to find benzodiazepines being recommended as sedatives for old people.

But this book looks and feels good, reads well and gives an informed positive account of geriatric neurology. I will refer to it often and will urge my junior colleagues to do the same.

GRAHAM MULLEY

The Brain: A Neuroscience Primer 2nd Edition. By RICHARD F THOMPSON. 1993. (Pp 496 Illustrated; Price: £25.95 board, £18.95 paper). Oxford, WH Freeman & Co. Ltd. ISBN Board 0-7167-2338-7, Paper 0-7167-2485-5.

This book aims to introduce someone with no background knowledge or prior exposure to the field to the basics of neuroscience and the biological aspects of psychology.

It is set out in a logical way. After an introductory chapter giving an overview of the nervous system there are chapters on the neuron, membranes and potentials, synaptic transmission and neurotransmitters and hormones. These are followed by consideration at a higher level: chapters on the hypothalamus and biological imperatives, then sensory and motor systems. Chapters follow on development and plasticity of the brain, chapters on learning and memory and finally language and consciousness. This is accompanied by an excellent glossary and an appendix reassuringly entitled 'A tiny bit of chemistry, physics, and pharmacology'. Each chapter is followed by a clear concise summary and a series of suggested readings and references.

Dr Thompson's style is easy to read. He conveys difficult ideas in a straightforward way and manages to avoid frequent abbreviations which often muddy technical writing. In introducing a subject he sets the historical context by describing how discoveries were made, particularly, it seems, those that led to Nobel prizes. Classical experiments, such as Hodgkin and Huxley's work with

squid axon and Pavlov's work with conditioning, are described. The descriptions of the current state of knowledge that follows are also punctuated with references to interesting experiments. The reader is left in no doubt that this is an advancing science. There are frequent illustrations (well over 100) that complement the text, and a few excellent cartoons. This excellent book should be on the reading list of every pre-clinical neuroscience course.

GN FULLER

SHORT NOTICES

New Functional Aspects of the Suprachiasmatic Nucleus of the Hypothalamus. (International Symposium, Osaka, Japan, October 1991). Edited by H. NAKAGAWA, Y OOMURA AND K NAGAI. (Pp 264; Price: £330.00, US\$60). London: John Libbey & Co. Ltd. 1993. ISBN 0 86196 329 6.

Parkinson's Disease: Symposium Review 1992. Edited by MERTON SANDLER. (Pp 65; Price: £12.00, US\$24). London: John Libbey & Co. Ltd. 1993. ISBN 0 86196 404 7.

This volume comprises papers presented at the Morbus Parkinson Symposium, Maastricht, January 1992, and the Satellite Symposium "The existing role of dopamine agonists: the search for new strategies", Munich, June 1992.

A useful practical review of current treatment.

Teamwork in Neurology. (Therapy in Practice Series/40). By RUTH NEUWENHUIS. (Pp 198; Price: £13.95). 1993. London: Chapman & Hall. ISBN 0-412-39350-6.

The Neuropsychology of Attention (Series: Critical Issues in Neuropsychology). By RONALD A COHEN. (Pp 545; Price: \$90.00 H/bk). 1993. New York, Plenum Publishing Corp. ISBN 0-306-43953-0

Neurology Secrets. Edited by LOREN A ROLAK. (Pp 432; Price: \$36.95). 1993. Philadelphia, Hanley & Belfus Inc. ISBN 0-56053-056-1

Electrical and Magnetic Stimulation of the Brain and Spinal Cord (Advances in Neurology, Vol. 63). Edited by O DEVINSKY, A BERIC AND MICHAEL DOGALI (Pp 323; Price: \$139.00) 1993. New York, Raven Press. ISBN 0-7817-0066-3.

Anatomic Localization for Needle Electromyography. By STEVE R GEIRINGER (Pp 154 Illustrated; Price: \$28.95) 1994. Philadelphia, Hanley & Belfus Inc. ISBN 1 56053 068 5.

Neurosurgery for the Third Millennium (Series: Neurosurgical Topics/11). Edited by MICHAEL LJ APUZZO, AANS Publications Committee. (Pp 209 Illustrated; Price \$80 for AANS members, \$90 for non-members, \$70 for AANS residents). 1992 Park Ridge, Illinois. The American Association of Neurological Surgeons ISBN 1-879284-08-1

Neurosurgery—The Scientific Basis of Clinical Practice (2 vols). Edited by A CROCKARD, R HAYWARD AND JT HOFF. (Vol.1 pp. 1-512, Vol.2 pp. 513-994; Price £195-00). 1992. Oxford, Blackwell Scientific Publications Ltd ISBN 0-86542-186-2 (The Set) 0-86542-235-4 (Vol. 1) P-86542-236-2 (Vol. 2).

The Mental Status Examination in Neurology/Third Edition. By RL STRUB AND FW BLACK. (Pp 244; Price: £19.95). 1993 Philadelphia, FA Davis Co. UK Distrib: Waverley Europe Ltd, London. ISBN 0-8036-8212-3.

The 3rd edition of this useful source of information and references. It includes valuable standardised items compared to data from formal neuropsychological tests, and age-related data. There is a selective discussion of the methods and appraisal of cortical function.

Metabolic Brain Dysfunction in Systemic Disorders. Edited by AI ARIEFF AND RC GRIGGS. (Pp 477 Illustrated; Price £80-00). 1992. A Little, Brown Medical Title UK Distrib: Edinburgh. Churchill Livingstone ISBN 0-316-05067-9.

Spinal Dysraphism (Series: Contemporary Issues in Neurological Surgery). Edited by TS PARK (Pp 190 Illustrated; Price: £49-50). 1992. Oxford, Blackwell Scientific Publications ISBN 0-86542-105-6.

CORRECTIONS

Anderson, Milne. The motor disorder of multiple system atrophy. *J Neurol Neurosurg Psychiatry* 1993;56:1239-42 (editorial). The dosage of dexamethasone should be 0.15 mg/kg body weight every six hours for four days.

A note on heterochromia iridis. *J Neurol Neurosurg Psychiatry* 1993;57:231. This short article should have been attributed to Dr Patrick J Morrison, Northern Ireland Genetics Service, Belfast City Hospital, Belfast BT9 7AB, UK.