Hospital Topics

Management of intracranial metastases

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Summary and conclusions

Of 223 patients with intracranial metastases, 161 underwent removal of a presumed solitary lesion and 29 were treated by burr-hole biopsy. Results of radical surgery were better than those of biopsy alone in terms of survival. Quality and duration of survival were poorer in patients who had infratentorial metastases removed than in those who underwent surgery for supratentorial metastases. In this second group only patients with breast cancer benefited from surgery, though a few women with bronchial carcinoma also did well.

The interval between removal of a primary tumour and development of intracranial symptoms did not influence outcome. Evidence of a previous primary tumour should not lead to the assumption that intracranial symptoms are caused by a metastasis.

Introduction

Patients with intracranial metastases generally have a poor prognosis. Grant[1] stated that radical or palliative surgery did not prolong life, but Paillas and Pellet[2] considered that the evidence showed the surgical approach was justified. We aimed at recording the results of surgery for intracranial metastases in terms of mortality and quality of life and relating these results to the nature of the tumour.

Patients and methods

Case records of all patients with intracranial metastases admitted to the Wessex Neurological Centre during 1965–76 were reviewed.

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There were 223 patients, of whom 190 had histological evidence of metastasis. Supratentorial tumours were shown by carotid angiography or radioisotope scanning, and were treated by removal (96 patients) or burr-hole biopsy (29 patients). Infratentorial tumours (65 patients) were shown by ventriculography, and were removed during exploratory examination of the posterior fossa.

Results

One patient was lost to follow-up, and in the remaining 189 (160 treated by removal of the tumour and 29 by burr-hole biopsy) the outcome was assessed according to duration and quality of survival related to site (supratentorial or infratentorial) and origin of tumour. Because most patients died at home, necropsy was carried out in only 16 patients.

DURATION OF SURVIVAL

Mean duration of survival is shown in table I. Three women with bronchial carcinoma survived for six, three and a half, and one and a half years after removal of a supratentorial metastasis; one patient with breast carcinoma survived for five years after removal of an infratentorial metastasis; two with malignant melanoma survived for 10 and nine months after removal of a supratentorial metastasis; and one with carcinoma of the colon survived for 16 months after removal of a supratentorial metastasis. When these seven patients were excluded the average duration of survival after tumour removal was 3·6 months in patients with bronchial carcinoma, 7·0 months in those with breast carcinoma, 4·0 months in those with malignant melanoma, and 3·5 months in those with carcinoma of the intestinal tract. In patients with renal carcinoma the relatively high figures shown in table I were due mainly to one woman who survived for 12 months after removal of a supratentorial metastasis, and a man who underwent a nephrectomy, a pneumonectomy for three metastases, and three craniotomies for a recurring left frontal metastasis over nine years. He was still alive 22 months after the last craniotomy.

TREATMENT OF PRIMARY TUMOUR

Fifteen patients had had a primary bronchial carcinoma removed before they presented with neurological symptoms, and four had undergone craniotomy. Of these 19 patients, removal (as opposed to

TABLE I—*Duration of survival in 189 patients after surgery for intracranial metastasis, according to site and origin of metastasis and treatment*

Site of metastasis	Treatment	Primary tumour: Bronchus		Breast		Melanoma		Gastrointestinal tract		Kidney		Others*	
		No of patients	Mean survival (months)	No of patients	Mean survival (months)	No of patients	Mean survival (months)	No of patients	Mean survival (months)	No of patients	Mean survival (months)	No of patients	Mean survival (months)
Supratentorial	Removal	45	6·3	9	10·3	13	4·8	9	4·9	6	11·5	14	6·9
Infratentorial	Removal	39	3·1	10	12·3	4	3·0	5	2·2	1	3	5	1
Supratentorial	Biopsy	18	0·8			1	3	3	2·8	2	1·5	5	0·8

* Includes tumours of uncertain origin.

biopsy) of the metastasis was carried out in 12, and the average duration of survival was 12 months when two of the long-term survivors mentioned above were included. When they were excluded the average survival was three and a half months. In 45 patients a chest x-ray film showed an unequivocal lesion; 26 of these patients had the intracranial metastasis removed, and the average duration of survival in this group was four months. In 50 other patients who had had a primary tumour other than bronchial carcinoma removed before undergoing neurosurgery the average survival was 6·7 months after removal of the metastasis. In this group the only long-term survivors were two patients with breast carcinoma, who survived for five and two and a half years respectively, and one with renal carcinoma, who survived for two years.

QUALITY OF SURVIVAL

Quality of survival after removal of the metastasis is summarised in table II. "Good" indicated appreciable improvement and relief of preoperative symptoms, with a return to a reasonable life. "Poor" indicated no real improvement after surgery. Some patients were placed in a "moderate" category, but inevitably the quality varied in some who initially improved after surgery and then relapsed.

TABLE II—*Quality of life in 160 patients after removal of intracranial metastasis, according to origin of metastasis*

Quality of life	Primary tumour						Total
	Bronchus	Breast	Melanoma	GI tract	Kidney	Others	
Good	2	8	1	1	1	0	13
Moderate	14	8	3	4	1	4	34
Poor	68	3	13	9	5	15	113

Discussion

Clearly a dogmatic view on the management of patients with intracranial metastases cannot be expressed, but the truth probably lies somewhere between the gloomy view of Grant[1] and the more enthusiastic views of others.[2–4] When analysing the results of intracranial surgery we considered four main aspects likely to have affected outcome. Firstly, the latent period between appearance of primary tumour and development of intracranial metastasis; secondly, whether multiple intracranial metastases were present; thirdly, the influence of the intracranial site and origin of the metastasis; and fourthly, the quality of survival after surgery.

LATENT PERIOD BETWEEN PRIMARY TUMOUR AND INTRACRANIAL METASTASIS

Some authors have suggested that a long latent period before metastases develop or a long duration of intracranial symptoms implies a good prognosis, [2 5] but in our study neither of these factors was related to duration of survival, particularly in patients with malignant melanoma, as Hayward[6] has also shown. Nevertheless, any patient who develops intracranial symptoms after removal of a primary tumour should not be assumed to be harbouring a metastasis, since another lesion, such as a subdural haematoma or meningioma, may be present.[7]

PRESENCE OF MULTIPLE INTRACRANIAL METASTASES

How often multiple intracranial metastases are present, even when the clinical and radiological evidence indicates that they are solitary, remains uncertain. Published reports are conflicting,[8–10] but suggest that in no more than 25% of patients are these truly solitary. Although the radiological limitations of preoperative diagnosis of multiple intracranial metastases have been emphasised,[11] computerised axial tomographic scanning may allow these limitations to be surmounted. The results of burr-hole biopsy are certainly inferior to removal of the tumour, as we found in our study and has been reported elsewhere.[3] The main reason for burr-hole biopsy, as opposed to removal, was the poor general and neurological state of some patients. Since such a state may be due to the presence of multiple metastases, this may be an important factor in the poor survival of patients subjected to burr-hole biopsy.

INFLUENCE OF INTRACRANIAL SITE AND ORIGIN OF THE METASTASIS

The results of our study agrees with others[2 3] in showing that average survival was longer after removal of a supratentorial than an infratentorial metastasis. The apparent exception of breast carcinoma was due to one five-year survivor mentioned above. The origin of the metastasis also affected survival.

Bronchus—Short survival after removal of intracranial metastases from bronchial carcinoma has been reported elsewhere,[3 4] and our results were no exception. Such gloomy figures are hardly surprising, since Legha *et al*[12] found that median survival of patients with bronchial carcinoma was six months from diagnosis.

Breast—More favourable results of treatment of intracranial metastases from breast carcinoma were reported by Stortbecker[13] (average survival 11·5 months), Richards and McKissock[3] (54% of patients having more than a six-month average survival), and Vieth and Odom[4] (36% of patients having more than a six-month average survival). The results after removal of the metastasis were also favourable in our study, but the precise reason for this was not clear. Many complex general factors influence survival in patients with breast carcinoma,[14] and these were not examined in our study. Hence the relatively favourable surgical results may have reflected the stage and control of the disease as much as the success of intracranial surgery. Nevertheless, an aggressive approach to an intracranial metastasis is justified, for it relieves distressing symptoms and allows the more general control of the disease, upon which length of survival probably will depend, to be pursued.

Kidney—Relatively few of our patients had carcinoma of the kidney, but the man referred to above illustrates the unpredictable nature of this tumour, and an average survival of over 12 months in 30% of such patients has been reported.[4 13] Two patients in the present study who were thought to be good examples of excellent survival because they survived for six years after removal of a solitary lesion proved on review of the histology to have a haemangioblastoma.

Melanoma and gastrointestinal tract—Poor results after neurosurgery in these two groups have been reported by others,[6 15] the overall impression from the published work on the gastrointestinal tract being particularly gloomy. This is especially evident in one study,[15] in which average survival periods of patients were analysed from first hospital admission for intracranial symptoms, and were the poorest of all, being even worse than those for bronchial carcinoma. Although long-term survival after removal of an intracranial melanoma metastasis has been reported,[16 17] the results are generally poor; this may be related to the high incidence of multiple metastases, a factor commented on by Beresford.[18]

QUALITY OF SURVIVAL AFTER SURGERY

Quality of survival after surgery has not been given enough attention in many of the reported series, but the available figures are depressing.[13 19] Both duration and quality of survival were poor in patients with carcinoma of the bronchus or gastrointestinal tract or malignant melanoma, and worth while in those with breast carcinoma (table II). Overall, however, only 13 out of 160 patients (8%) had a good quality of life, most of

whom were patients with breast carcinoma. A similar figure was reported in a study by Richards and McKissock,[3] in which 16 of 22 long-term survivors remained well (only 10% of the patients subjected to craniotomy). Again, the best results were in patients with breast carcinoma.

Conclusion

Patients with supratentorial metastases have a better prognosis than those with infratentorial metastases. Among patients with infratentorial metastases, only those with breast carcinoma will occasionally benefit from neurosurgery. Among patients with supratentorial metastases, the only ones who are likely to benefit from neurosurgery, in terms of length and quality of survival, are those with breast carcinoma; some women with bronchial carcinoma; and an occasional patient with renal carcinoma.

The results of neurosurgery for an intracranial metastasis were not related to the interval between removal of a primary tumour and development of intracranial symptoms. Evidence of a previous primary tumour should not lead to the assumption that intracranial symptoms are due to a metastasis.

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General Practice Observed

Developmental surveillance in general practice

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Summary and conclusions

During a two-year study of a developmental surveillance programme covering all children under 5 in a large general practice in the south of England, 2157 children were examined, including 382 newborn babies seen at home. Suspected disorders—excluding those found during non-routine consultations—were discovered in 232 children (15% of boys and 11% of girls), of whom 171 (104 boys and 67 girls) were referred to specialist agencies.

The number and nature of the disorders show that routine surveillance on the lines proposed by the Court Committee is worth while. Nevertheless, such programmes could not be started on a national scale without increased resources for the specialist services to which more children would need to be referred.

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Introduction

In the United Kingdom paediatric care in general practice has been largely illness oriented. Some general practitioners, however, have anticipated the Court Report's proposals[1] in starting health care and surveillance programmes.[2-4] During the last 10 years we have developed a surveillance programme for all the under-5s in our practice. This comprises immunisation and developmental guidance, a co-ordinated health visitor service, and a set of routine examinations including both a medical and a developmental component. In this paper we indicate the rate of suspected (not necessarily confirmed) abnormalities detected by our examinations, and discuss the implications for the work load of the specialist services. Such estimates are an essential preliminary to setting up any nation-wide surveillance programme on the lines of the Court Report's recommendations.

Patients and methods

There are usually about 1100 children under 5 in our six-man practice of 18 500. The percentage of the population in each social class in the area covered by the practice (with national figures in parentheses) is: I—9 (5); II—16 (14); III—53 (54); IV—13 (17); V—5 (6).

The three doctors who take part spend four sessions a week (46 weeks a year) on the surveillance programme, excluding home visits to newborn babies. About three-quarters of the doctor's time in the clinic is spent on routine examinations and the rest on the more usual