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The fate of recipients of organs from donors with diagnosis of primary brain tumor

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Sir: The topic discussed is the indication of donors with the diagnosis of a primary CNS tumor. The shortage of organs suitable for transplantation has resulted in extending the indication criteria of cadaver donors for organ harvesting, but the fact that transmission of CNS tumors to organ recipients – while rare – does occur [1–5] requires caution. Possible transmission of CNS tumors was discussed even by a special commission of the Council of Europe, which

accepted a recommendation (1997) according to which brain tumors are divided into three groups according to their probability of transmission [6]. We conducted a retrospective study designed to monitor the fate of recipients of organs from donors with a CNS tumor, to establish whether or not the malignancy was transferred.

A total of 2,048 cadaver organ donors were indicated for organ harvesting in the Czech Republic in the 1986–1998 period; in 42 (2.1%), the underlying diagnosis was CNS tumor. The group comprised 20 male and 22 female, the mean of age was 36.7 ± 5.3 years ranging from 8 to 66 years. In 11 cases, the diagnosis of a tumor was established on the basis of biopsy; in the remaining cases, it was based on CT findings; in three donors, the tumor (meningioma and glioblastoma in two cases) was not discovered until autopsy (the original diagnosis hav-

ing been spontaneous hemorrhage). The morphological type of the brain tumor was established on the basis of autopsy findings. A neurosurgical intervention was performed in 12 cases (29%). In this risk group, meningioma were represented in five cases, glioblastoma multiforme in four, astrocytoma in two and craniopharyngioma in one case. A neurosurgical intervention directly preceded immediately the diagnosis of brain death (at least one day and maximum of seven days in advance). Only in one case (meningioma), a neurosurgical intervention preceded the diagnosis of brain death by 13 months. The existence of a ventricular shunt was not recorded in the group.

The numbers of the individual types of tumors diagnosed were as follows (Table 1): meningioma in 13 cases (31.0%), glioblastoma multiforme in nine (21.4%), astrocytoma in three (7.1%), medulloblastoma in

Table 1 Number, incidence of individual CNS tumors of organ donors and recipient follow-ups. (Minimum follow-up means the follow-up of living recipients)

Type of tumor	No. (%)	Transplanted organs	Recipient follow-up				Cause of death (period after transplantation)
			Minimum (months)	Maximum (months)	Living No.	Died No.	
Meningioma	13 (31.0)	25 Kidneys 1 Liver 1 Lung	24.2	170.2	18 1 1	7 0 0	Generalization of gynaecological ca (73 months) Generalization of bronchogenic ca (49 months) Myocardial infarct (1.9, 0.6 and 40 months) Bronchopneumonia (1.3 and 8 months)
Glioblastoma multiforme	9 (21.4)	18 Kidneys 3 Livers 2 Hearts	26.9	145.0	16 3 1	2 0 1	Stroke (77 months) Bronchopneumonia (0.9 month) Graft failure (0 month)
Astrocytoma	3 (7.1)	6 Kidneys 1 Heart	54.8	170.5	5 1	1 0	Myocardial infarct (61 months)
Medulloblastoma	2 (4.8)	4 Kidneys	71.4	103.3	4	0	
Craniopharyngioma	1 (2.4)	2 Kidneys	59.8	59.8	2	0	
Neurinoma of n. acousticus	2 (4.8)	4 Kidneys	103.6	174.5	4	0	
Pituitary adenoma	2 (4.8)	4 Kidneys	94.1	153.3	3	1	Bronchopneumonia (4.1 months)
Lymphoma	1 (2.4)	1 Heart	–	–	0	1	Graft failure (0 month)
Unspecified	8 (19.0)	16 Kidneys 1 Liver	44.4	163.8	12 1	4 0	DM complication (62.5 months) Myocardial infarct (73 and 53 months) Bronchopneumonia (61 months)
Metastasis of bronchogenic carcinoma	1 (2.4)	None	–	–	–	–	

two (4.8%) followed by craniopharyngioma, neurinoma of n. acusticus, pituitary adenoma, lymphoma, and unspecified in eight cases. In four cases, autopsy confirmed a primary brain tumor, and the histological type of the tumor was further identified. In another four cases, the type of CNS tumor could not be identified because of a high degree of autolysis. In one case, the autopsy showed metastasis of bronchogenic carcinoma thus the diagnosis of CNS tumor was erroneous! As the results of autopsy became available before transplantation, the organs of this particular donor were contraindicated for transplantation, as were the kidneys of a donor with lymphoma, his heart, however, had been transplanted by the time the results of autopsy became available. The recipient died immediately after transplantation, thus malignancy transfer could not be established. Another 91 organs (79 kidneys, 3 hearts, 5 livers, 3 pancreases and 1 lung) were transplanted into 88 recipients. The longest follow-up was 14.5 years and the shortest one was 24.2 months.

Six recipients died in the immediate post-transplant period, thus malignancy transfer could not be verified in these cases. These early-death-recipients had obtained organs from donors with following

morphology diagnoses: glioblastoma multiforme in 2 cases, meningioma in 3 cases and lymphoma in 1 case). Eleven recipients died in the late post-transplant period; of this number, two died due to malignancy (generalization of gynaecological carcinoma and bronchogenic carcinoma) and rest of them died due to other reasons without symptoms of malignancy. In these two cases, generalization of a transferred primary CNS tumor was not involved but de novo development of malignancy (meningiomas were diagnosed in donors). The other 72 recipients are alive and show no clinical signs of malignancy transmission.

In a group of 42 donors with the diagnosis of primary brain tumor (with 29% undergoing a neurosurgical procedure), no malignancy transmission was demonstrated in all 89 recipients. Although we did not demonstrate tumor transmission, it is impossible to draw any generalized conclusions because of the small number of patients in the study. Although there is a risk of malignancy transfer, it is fairly low. The question is whether, in life-saving procedures (liver or heart transplantation in patients on the high urgency list) and in cases where a neurosurgical intervention or radiation therapy in the donor has not been performed, transplantation should be considered.

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