Evaluation of brain tumor resection with hypofractionated radiotherapy: retrospective study

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Introduction

Tumor resection is effective for intracranial tumors. However, recurrence may occur early after resection. Chemotherapy and radiotherapy are administered for residual tumor cells. Radiotherapy, including hypofractionated radiotherapy, may be effective for intracranial tumors. The purpose of this study was to evaluate brain tumor resection with hypofractionated radiotherapy.

Methods

Dogs with intracranial tumors underwent resection by the same surgeon; some dogs received radiotherapy and/or chemotherapy. Dogs with hematomas and meningiomas were excluded. Kaplan–Meier survival curves and log-rank analysis were used to compare the presence and absence of radiotherapy.

Results

Surgery was performed in 18 dogs; postoperative radiotherapy and chemotherapy were administered in 7 and 4 dogs, respectively. The tumor locations were the cortex (n=17) and brainstem (n=1). The diagnoses were anaplastic oligodendrocyte (n=6), glioblastoma (n=3), granulomatous meningoencephalitis (n=3), histiocytic sarcoma (n=2), glioma (n=2), oligodendrocyte tumor (n=1), and choroid plexus papilloma (n=1). Chemotherapy drugs were not administered in dogs that received radiotherapy. A median of 26 Gy of radiotherapy in 4 fractions was administered for 1 month. The overall survival times in dogs that underwent surgery with/without chemotherapy, with chemotherapy, and with radiotherapy were 2.5, 5.5, and 13 months, respectively. Acute and late radiation-associated adverse events were not noted. Dogs that received radiotherapy survived significantly longer than dogs that underwent surgery with/without chemotherapy ($p<0.01$).

No.	Breed	Sex	Age	Pathology	Treatment	OS (days)	Follow-Up
1	French bulldog	FS	8	Anaplastic oligodendrocyte	Surgery ＋ RT	46	Survival
2	Miniature dachshund	MI	13	Anaplastic oligodendrocyte	Surgery ＋ RT	152	Survival
3	French bulldog	MI	7	Anaplastic oligodendrocyte	Surgery ＋ RT	178	Survival
4	French bulldog	MC	6	Anaplastic oligodendrocyte	Surgery ＋RT	49	Survival
5	French bulldog	MI	10	Anaplastic oligodendrocyte	Surgery ＋ RT	68	Survival
6	French bulldog	FS	4	Anaplastic oligodendrocyte	Surgery ＋RT	177	Survival
7	French bulldog	FS	12	Astrocytic tumor	Surgery ＋ RT	423	Death
8	Miniature Schnauzer	MI	8	GME	Surgery alone	25	Death
9	Pembroke Welsh corgi	MC	5	GME	Surgery alone	43	Death
10	Pembroke Welsh corgi	MC	11	GME	Surgery alone	78	Death
11	Bernese Mountain Dog	FI	5	Histiocytic sarcoma	Surgery alone	67	Death
12	Pembroke Welsh corgi	MI	11	Histiocytic sarcoma	Surgery alone	69	Lost follow-up
13	Shiba inu	MI	9	Choroid plexus papilloma	Surgery alone	18	Death
14	Yorkshire Terrier	MC	11	Oligodendrocyte tumor	Surgery alone	116	Death
15	Papillon	FS	13	Astrocytic tumor	Surgery alone	360	Death
16	Chihuahua	FI	11	Glioblastoma	Surgery alone	167	Death
17	Cavalier King Charles Spaniel	FS	15	Glioblastoma	Surgery alone	52	Death
18	French bulldog	MC	10	Glioblastoma	Surgery alone	10	Survival

Table 1: Signals and treatments were summarized.

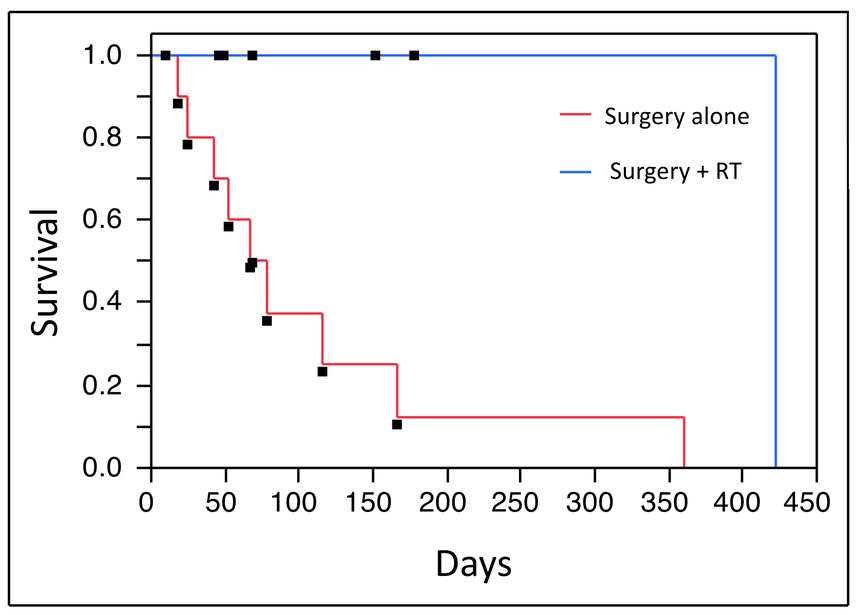

Fig. 1: Kaplan-Meier survival curve of overall survival (OS) with surgery alone and with radiation therapy. The median OS were surgery alone and with radiation therapy 67 Days (range, 10-360 days), 152 days (range, 46-423), respectively.

Conclusion

Surgery and postoperative hypofractionated radiotherapy might be effective for central nervous system tumors.

Disclosure of Conflict of Interest: None.