



Volumetric growth rate of recurrent major salivary gland pleomorphic adenoma

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ABSTRACT

Objectives

Pleomorphic adenoma (PA) is the most common benign tumor of the major salivary glands. Surgical excision is the treatment of choice due to potential for malignant degeneration. Inadvertent capsule rupture may lead to tumor recurrence. Surgery for recurrent PA is challenging and carries a high risk of patient morbidity, specifically in regards to facial nerve function. Slow tumor growth may obviate the need for undergoing salvage surgery. Our objective was to determine the growth rate of recurrent pleomorphic adenomas.

Study Design

Case series

Methods

All patients at our tertiary academic medical center with recurrent PA between the years 2003-2013 were identified. Patients who had at least two interval imaging studies without intervening surgical intervention were included. A neuroradiologist calculated total volume (TV) of recurrent tumor on both studies. Our main outcomes were percent change in TV, as well as tumor growth rate.

Results

Fourteen patients met inclusion criteria. Median interval time between imaging studies was 12.8 months. The median rate of growth was 0.88% per month. Three tumors demonstrated no growth between interval imaging studies and two tumors had interval reduction in TV. For the 9 patients who had tumor growth, median percent change in TV was 31%. The median growth rate of these tumors was 1.8% per month.

Conclusions

The growth rate of recurrent pleomorphic adenoma is extremely variable, though the median growth rate for enlarging tumors is estimated at 2% per month. Tumor growth rate should be estimated on an individual patient basis. For slow growing tumors, physicians may weight the risk of this slow growth with the morbidity of re-operation.

BACKGROUND

•Pleomorphic adenomas (PAs) the most common benign neoplasm of the major salivary glands¹

•Despite surgical resection, PAs may recur at a rate of 2-3%²

- Pseudopodia³, inconsistent capsule⁴, satellite lesions⁵
- Tumor spillage⁶

•Surgical resection for recurrent pleomorphic adenoma (RPA) is more challenging⁷

- Multifocal disease (Figure 1)
- Previously scarred field
- Worse facial nerve outcomes

•Given that PAs are slow growing neoplasms and that re-resection has high morbidity, one may posit if RPAs are also slow growing this may obviate the need for salvage surgery

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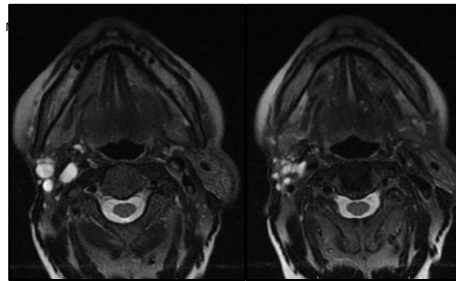


Figure 1. Consecutive cuts of an axial T2-weighted MRI of a patient with RPA demonstrating the multifocal nature of recurrence.

SPECIFIC AIMS

1. Determine the growth rate of recurrent pleomorphic adenomas
2. Use this growth rate to determine an appropriate interval imaging for surveillance

METHODS

•Retrospective chart review (Figure 2) identifying cases of RPA at our tertiary care center between 2003-2013

•Included if:

- Two interval imaging studies completed without intervening management (surgery or radiation)
- Growth between imaging studies

•A neuroradiologist reviewed images and calculated total volume (TV)

- TV = AP (anterior-posterior) measurement x CC (craniocaudal) measurement x TRV (transverse) measurement

•Outcomes

- Percent change in TV
- Tumor growth rate (%/day)

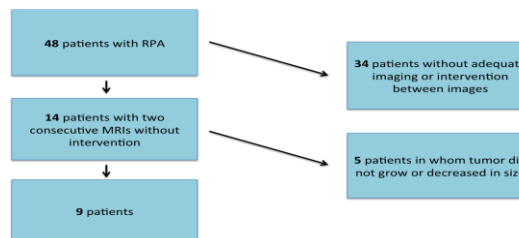


Figure 2. Retrospective Chart Review

RESULTS

- 9 patients met criteria for inclusion (Figure 2)
- Demographics
 - 3 males, 6 females
 - Average age= 58
- Percent change in TV
 - Average = 144.7% (Range = -11.5%-1,023%)
 - Median = 31%
- Tumor growth rate (%/day)
 - Average = 0.40%/day (Range = 0.028%- 2.774%)
 - Median = 0.06%

Patient	Days between images	TRV1	AP1	CC1	TV 1	TRV2	AP2	CC2	TV2	Percent change	Percent change /day
1	390	4.6	3.4	5.4	353.8	5.1	3.3	5.6	394.8	11.6	0.029
2	44	2.8	3.5	3.4	139.6	3.1	3.5	3.4	154.5	10.7	0.244
3	282	2.3	2.7	3.3	85.8	2.4	2.8	3.3	92.9	8.2	0.029
4	369	1.8	1.6	3.1	37.45	3.8	4.4	6	420.2	1023.7	2.774*
5	788	0.6	1.1	1.1	3.0	0.9	1.2	1.3	5.9	93.4	0.119*
6	468	4.7	3.3	9	584.7	4.9	3.5	9.2	660.9	13.0	0.028
7	1033	1.3	1.3	1.6	11.3	1.5	1.4	2	17.6	55.3	0.054
8	197	1.4	0.7	1.7	7.0	1.6	0.9	1.8	10.9	55.6	0.282*
9	516	0.9	2	1.4	10.6	1	2.2	1.5	13.8	31.0	0.600

Table 1. Volumetric growth of recurrent pleomorphic adenomas between two consecutive MRIs. Asterisk denotes re-recurrence. TRV= transverse. AP= anterior-posterior. CC= craniocaudal. TV= total volume.

CONCLUSION

- Growth rate extremely variable (Table 1)
- Median growth rate 31%, but clinical significance is debatable
- Individual tumor growth rate should be involved in the management decision of RPAs, as re-resection carries a significant morbidity risk

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