Review Article

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Pleomorphic Adenoma of Parotid Gland in The Elderly: Do We Always Need to Operate?

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Abstract:

Introduction: Pleomorphic adenoma is the most common salivary gland tumor, which usually involves the parotid gland. It can seldom undergo malignant transformation. Therefore, the best treatment to avoid malignant transformation is to excise the tumor, which is a straightforward decision in young and fit patients. However, surgery under general anaesthesia can lead to a rapid postoperative cognitive impairment in the elderly patients. Also, some patients may be at a higher risk for a general anaesthetic due to their general health and associated medical conditions.

Aim: To discuss the advantages and disadvantages of surgical versus non-surgical management of parotid pleomorphic adenomas in the elderly and medically compromised.

Methods & Material: A review of English literature.

Conclusion: A decision to excise a parotid pleomorphic adenoma, with no malignant pointers, in the elderly and in patients who are high risk for general anaesthesia should be taken cautiously and a non-surgical approach should be considered.

Key words: *Pleomorphic adenoma, parotid, delirium, cognitive dysfunction, dementia, management.*

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Introduction

Pleomorphic Adenoma is a benign and the most common neoplasm of parotid glands, which uncommonly undergoes malignant transformation. The universal treatment of pleomorphic adenoma is surgery that ranges from enucleation to partial parotidectomy. However, elderly and seriously medically compromised patients require special consideration.

Postoperative central nervous dysfunction, including delirium with or without postoperative cognitive dysfunction, can lead to functional decline as well as a prolonged hospital stay with the risk of institutionalization. Therefore, a dilemma regarding surgery arises in the management of elderly patients and patients who present high general anaesthetic risk. The paper discusses the risks of surgical treatment versus the risk of the 'wait & watch' policy in this group of patients.

Natural history

Pleomorphic adenoma is the commonest benign salivary gland tumor (84 - 90% of parotid benign tumor). It is thought to originate from intercalated duct cells that give rise to a mixed population of epithelial cells and myoepithelial cells. It is more common in women than men by a ratio of 3:2. There is a wide range of age incidence and typically appears in between the fourth and sixth decades of life. Most pleomorphic adenomas occur in the superficial lobe and are almost always singular.

Pleomorphic adenoma can seldom undergo malignant transformation and it has been associated with a long duration, an advanced age and tumor size. This risk is only about 1.5% for duration of <5years but increases to 9.5% for duration of >15years [1]. Some studies have reported this risk to be as high as 25% in untreated patients [2].

The WHO histologic classification (2005) described three subtypes of malignant pleomorphic adenoma – (1) carcinoma ex-pleomorphic adenoma, (2) carcinosarcoma (true malignant mixed tumor), and (3) metastasising pleomorphic adenoma. Carcinoma ex-pleomorphic adenoma is malignant transformation in a pre-existing pleomorphic adenoma and is the most common subtype. The latter two subtypes are extremely unusual [3]. Carcinoma ex-pleomorphic adenoma is aggressive malignancy and accounts for 3.6% of all salivary neoplasm and for 11.7% of salivary malignancies [4].

Most patients in whom pleomorphic adenoma undergoes malignant transformation have warning symptoms, the most common of which are rapid enlargement of tumor, pain and facial nerve palsy [3].

Diagnosis of malignant pleomorphic adenoma can be difficult on fine needle aspiration cytology (FNAC) and Magnetic Resonance (MR) imaging. One study concluded that FNAC, when positive, is a good examination of malignant tumors, with a sensitivity of 67%, specificity of 79%, positive predictive value of 86%, and negative predictive value of 100% [5]. A UK study by Balakrishnan et al. (2005) showed some variation in sensitivity and specificity of FNAC in distinguishing malignant from benign tumors in a University Teaching Hospital (sensitivity 79%, specificity 84%) and a District General Hospital (sensitivity 38%, specificity 95%) [6].

MR findings of carcinoma ex-pleomorphic adenoma are not specific because of the co-existence of different tissue types. However, diffusion-weighted MR images enable tissue characterization at the microscopic level by revealing the various tissue components in carcinoma ex-pleomorphic adenoma, which allows differentiation of benign from malignant salivary tissue [3].

The clinical picture, FNAC by an experienced cytologist along with MR imaging should therefore all be taken into consideration whilst making a diagnosis of malignant transformation in pleomorphic adenoma. The definitive diagnosis rests on histopathological examination. The ideal way to prevent and treat carcinoma ex-pleomorphic adenoma is early and radical removal of all major salivary gland tumors. Surgery with or without postoperative radiotherapy provides the best loco-regional control of carcinoma ex-pleomorphic adenoma with 5 years survival rate ranging between 30-76% [2].

Management dilemma

The removal of these benign tumors would ideally prevent the malignant changes, but the required anaesthesia and surgery carry a considerable risk of general cognitive decline. This decision to operate on a newly presenting parotid pleomorphic adenoma is not so straightforward in patients who are high risk for general anaesthesia and in elderly patients.

High general anaesthesia risks are most commonly due to (1) an untreatable cardiac condition, (2) type II respiratory failure, and (3) neuromuscular pathology, which eventually leads to type II respiratory failure.

Table 1. Preoperative risk factors for postoperative cognitive dysfunction

No.	Risk factors
1	Increasing age
2	Little education
3	Pre-existing depression or delirium
4	Existing dementia or cognitive impairment
5	History of stroke
6	History of previous myocardial infarction
7	Recent surgery: Thoracic, Vascular, Orthopaedic procedures
8	Medications (anticholinergics, antipsychotics, benzodiazepines)
9	High New York Heart Association class

The exact mechanism of postoperative decline in cognitive functions is not known. It can be broadly classified into patient factors, type of surgery and anaesthetic technique. Some elderly patients may be moving toward dementia and any stress, such as surgery, can aggravate the process and cause a rapid decline in their cognition. The associated preoperative

risk factors for postoperative cognitive impairment are mentioned in Table 1 [7]. The postoperative abrupt decline in cognitive function can lead to increased mortality, physical morbidity, prolonged hospital stay, loss of independence, risk of institutionalization and withdrawal from society; it also increases the cost of healthcare provision [8].

Postoperative cognitive impairment was initially noted in patients undergoing cardiac surgery, but more recently this has also been noted in patients undergoing non-cardiac surgery.

The postoperative cognitive disorders can be classified into three categories, although it is not yet clear whether these three are discrete problems or if they progress from one form to the next. These categories are (1) delirium, (2) postoperative cognitive dysfunction and (3) dementia.

Delirium is one of the most common postoperative complications in elderly patients, with an incidence ranging from 5.1% to 52.2% [9]. The word 'delirium' is derived from the Latin term meaning "off the track." It is a transient and usually reversible cause of cerebral dysfunction manifesting clinically with a wide range of neuropsychiatric abnormalities. The clinical hallmarks are decreased attention span and fluctuating confusion; recovery is usually complete.

Morimoto et al. [10] used Hasegawa Dementia Scores (Table 2) [11] and a Kana-hiroi test (character discrimination test) to predict the risk of postoperative delirium after abdominal surgery in the elderly. Elderly patients with a low preoperative Kana-hiroi test score and low perioperative cerebral oxygen saturation were at a greater risk of developing postoperative delirium [10].

Postoperative cognitive dysfunction is defined as a deterioration of intellectual functions presenting as impaired memory or concentration. This is usually mild and may not be

Table 2. Hasegawa Dementia Scale – Revised (HDS-R)

1	How old are you? (+/- 2years)		0 1
2	Year, month, date, day. 1 point each	Year Month Date Day	0 1 0 1 0 1 0 1
3	What is this place? Correct answer in 5seconds: 2 points Correct choice between 'office' and 'hospital'		 0 2 0 1
4	Repeating 3 words. 1 point each (To use only one version per test) Version A: a)cherry blossom, b)cat, c)tram Version B: a)plum blossom, b)dog, c)cat	a) b) c)	0 1 0 1 0 1
5	100-7=? If correct, 1 point If not: skip to item #6 -7 again=? If correct, 1 point	93 86	0 1 0 1
6	Repeat 6-8-2 backwards If not: skip to item #7 Repeat 3-5-2-9 backwards		0 1 0 1
7	Recall 3 words. For each word 2 points for spontaneous recall 1 point for correct recall after category cue	a) b) c)	0 1 2 0 1 2 0 1 2
8	Show five unrelated common objects, then take them back and ask for recall. 1 point each		0 1 3 3 4 5
9	Name all vegetables that come to mind. No time limit. May remind once. Terminate when there is no further answer for 10sec interval. For each vegetable named after the 5th one : 1 point		0 1 2 3 4 5
	Total score		/30

detected for days or weeks after surgery; it can last for several weeks or can be permanent.

A large prospective controlled international study on postoperative cognitive dysfunction in the elderly [12] demonstrated a cognitive deficit in about 10% of elderly patients 3 months postoperatively, whereas only about 3% of the age-matched controls that were not hospitalized were similarly impaired. Among patients over 75 years of age, 14% had a persistent cognitive deficit after general anaesthesia and surgery [11]. Postoperative cognitive impairment was also noted in middle-aged patients, but it lasted longer in the elderly [13]. There have been no studies so far to predict the risk of postoperative cognitive impairment in patients undergoing parotidectomy.

Dementia postoperatively however is extremely rare and is defined as the deterioration of brain function that results in loss of memory, reduced language skills, impaired reasoning and loss of daily living skills. It usually lasts more than six months and is not associated with a loss or alteration of consciousness.

A dilemma therefore arises as to whether, in order to avoid the risk of malignant transformation, we should operate on these patients with the attendant risk of postoperative cognitive impairment and whether all this implies or adopts a 'wait and watch policy'. Such a policy would involve annual MR imaging at regular intervals with surgical intervention in the event of any worrying symptom, sign and/ or radiological change. The patient should be involved in the decision making with a discussion of the advantages and disadvantages of both approaches.

Conclusion

Parotid pleomorphic adenoma is the most common salivary neoplasm, which is usually managed surgically; it carries a small risk of malignant transformation. There is growing evidence for postoperative cognitive impairment, following a general anaesthesia, in the elderly, which can lead to increased dependence, can cause isolation, institutionalization and uncommonly lead to death. The decision to operate should therefore be decided with caution in elderly patients and those who are high risk for general anaesthesia. A 'wait & watch' policy is the wiser choice in such cases where the tumor is clinically, cytologically and radiologically benign. We believe that this is the right approach for management of parotid pleomorphic adenoma in the elderly and for whom general anaesthesia carries a significant risk.

Conflict of interest statement

The authors do not declare any conflict of interest or financial support in this study.

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