

# Fine needle aspiration biopsy in orbital tumours

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## Abstract

**Fine needle aspiration biopsy (FNAB) was performed in 46 patients with an orbital mass. Positive cytological identification was made in 43 biopsy specimens. In 26 cases with histopathological control the accuracy was 81%. In experienced hands FNAB is safe and appears to be a valuable tool in establishing a diagnosis of malignancy in orbital tumours.**

Fine needle aspiration biopsy (FNAB) has been used in the diagnosis of neoplasms of various organs such as thyroid, pancreas, lung, abdomen, or breast.<sup>1-4</sup> Schyberg<sup>5</sup> was the first to describe its use in orbital tumours. Ideally FNAB should establish the diagnosis of a malignant unresectable orbital neoplasm, to eliminate or plan the need for surgical intervention.

In this study the value of FNAB in the diagnosis of orbital tumours is evaluated, and its place in the management of orbital tumours will be discussed.

## Material and methods

Between 1984 and 1990 FNAB was performed in 46 of the patients referred to the Orbital Centre with an orbital mass. The technique has been described previously in more detail.<sup>6</sup> A 23 gauge needle attached to a 20 ml disposable syringe held in a pistol grip (Cameco, Sweden) is used. After thorough cleaning of the skin the area above the tumour is firmly held with one hand and the needle is inserted through the skin into the lesion. No local anaesthesia is required. When the needle enters the tumour, the operator retracts the plunger, obtaining a negative pressure in the system. To aspirate sufficient material the needle is moved back and forth into the lesion while the vacuum is maintained. Then the plunger is released, equalising the pressure in the system, and the needle is withdrawn from the mass and slides are prepared. The accuracy of the FNABs with histopathological control was calculated.

## Results

The age of the patients at presentation varied from 20 to 89 years (median 60 yr). There were 29 women and 17 men. The presenting symptoms were swelling in 14, ptosis in 12, pain in 11, proptosis in 11, diplopia in 10, visual acuity decrease in three, and epiphora in two patients. The site of the tumours was superotemporal in two, on the eyelid in 15, superonasal in two, retrobulbar in one, and in the lacrimal sac in one. The extent of the tumour was established by computed tomography (CT) in all cases. Biopsy was performed on retrobulbar tumour with CT guidance. The cytological diagnoses are listed in Table 1. Three biopsies yielded insufficient

material. Eighteen of the aspirates were diagnosed as benign whereas 25 were diagnosed as malignant. Histopathological control was available in 26 cases (57%). In 21 cases histopathology confirmed the cytological diagnosis. In five cases the cytological diagnosis did not correspond to the histopathology. The cytological diagnosis was pseudolymphoma in these five cases, whereas histopathological control showed a non-Hodgkin's lymphoma in three cases and a liposarcoma in two cases. This yields an accuracy of 81% in the group with histopathological control.

## Discussion

A major area of concern in FNAB is sampling error. While the accuracy is high, false positive reports which may lead to an operation as the result of a faulty diagnosis are almost non-existent. In the group with histopathological control the accuracy was 81%. However, in five cases cytological diagnosis did not show a malignancy whereas histopathological control did, so we still have to regard non-malignant results of an FNAB with suspicion.

In other studies of FNAB of the orbit the accuracy varied from 47 to 100%.<sup>7-12</sup> But not all biopsies had histopathological control. Krohel *et al* found only 47% accuracy in FNAB under direct visualisation.<sup>7</sup> In their study there was a routine pathological examination after surgery in all cases, but 50% of the lesions did not lend themselves to identification by FNAB.

The indication for FNAB in all patients was to establish or exclude a diagnosis of malignancy, which is mandatory in deciding between surgery and observation. In operable cases surgical treatment may be systematically planned at an early stage; in inoperable cases it may suffice to establish the diagnosis.<sup>1</sup> It is a simple and safe diagnostic method<sup>11-16</sup> and provides the necessary information with minimal or no alteration in the natural behaviour of the tumour.<sup>18</sup> FNAB is usually less painful than a venepuncture, so there is no need for local anaesthesia. In this way the distortion of the local anatomy can be minimised.<sup>17</sup> Needle tract seeding described after punctures in other places<sup>18-21</sup> was not observed.

Table Cytological diagnosis after FNAB (n=46)

Pseudolymphoma	9 (9)*
Non-Hodgkin's lymphoma	8 (2)
Adenocarcinoma	7 (2)
Non-specific inflammation	6 (4)
Squamous cell carcinoma	4 (2)
Pleomorphic adenoma	4 (4)
Adenocystic carcinoma	1 (1)
Dermoid cyst	1 (1)
Neuroblastoma	1
Old haematoma	1 (1)
Eosinophilic granuloma	1
Inadequate specimen	3

\*Histopathological control in parentheses

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When the tumour is located in a palpable site, the biopsy is easier than when it is situated deep in the orbit. Kennerdell *et al*<sup>13</sup> advocate that fine needle aspiration should not be used for lesions that are anterior to the orbital septum, but prefer incisional or excisional biopsy techniques for these lesions. We consider FNAB easy and less invasive than an incisional biopsy. Since doubtful non-malignant results can easily be verified, our first choice will be FNAB in these preseptal lesions.

The CT scan is an indispensable tool in locating a process in the orbit.<sup>16</sup> If the mass is inside the muscle cone adjacent to the optic nerve, ultrasound usually provides helpful guidance. Orbital apex tumours and optic nerve lesions may be reached with CT guidance.<sup>13 15-17 22-24</sup> Without the help of CT or ultrasound FNAB should be restricted to preseptal and parabolbar areas to prevent complications.<sup>22</sup>

Better results are obtained when all the aspirations are performed by one clinician who is proficient in the technique.<sup>25</sup> The specimen should be interpreted by one person both familiar with the identification of cells in smears and experienced in orbital pathology. If any of the team members are not available or a lack of enthusiasm for the technique predominates, it is doomed to failure.<sup>13</sup>

Because FNAB acquires a small volume of tissue at the tip of a needle, representative tissue may not be obtained and a sampling error is introduced. One may sample the inflammatory response at the periphery of a neoplasm rather than the neoplasm itself, resulting in a misdiagnosis.<sup>13 26</sup> Wegener's granulomatosis is one of the diseases that can easily be missed owing to its inflammatory appearance.<sup>27</sup> Moreover in tumours of fibrous consistency and those located in the orbital apex, or in lymphocytic lesions, FNAB is less reliable.<sup>28</sup>

Considering the good results that have been reported, together with our own, we consider a FNAB to be reliable if the cytology points in the direction of malignancy. In contrast, a non-malignant cytological diagnosis should not be considered an unequivocal proof of absence of malignant disease. Lesions whose aspirates contain non-diagnostic material and whose clinical appraisals are in disagreement with the cytological findings (in our series the pseudo-lymphomas) should always be subjected to biopsy for histopathological examination.<sup>29</sup>

In conclusion, FNAB is a rapid and minimally invasive diagnostic technique that shortens time in hospital and reduces the costs of health care.

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