Fine needle aspiration cytology as a preliminary diagnostic tool in chondroid syringoma: a case report and review

Abstract: We report a case of chondroid syringoma (CS) in a 44-year-old male. He presented with a firm asymptomatic nodule in his left upper lip of 2-year duration. The initial clue to the diagnosis was made on fine needle aspiration cytology (FNAC), and a final diagnosis was based on histopathological examination. The case highlights the importance of FNAC in providing clues to the diagnosis of suspected cases of chondroid syringoma before performing large excisions and repair, which would require more skill and time. We have also reviewed the cytological findings of all the cases of benign CS reported until the current date.

Keywords: chondroid syringoma, pleomorphic adenoma, adnexal tumours, fine needle aspiration cytology

Introduction

Chondroid syringoma (CS) is a rare cutaneous tumour originating from eccrine and apocrine sweat glands with both epithelial and mesenchymal components. The incidence is low, forming less than 0.01% of primary cutaneous tumours. The clinical diagnosis is challenging. Histopathology is imperative to reach the diagnosis. The role of fine needle aspiration cytology (FNAC) has been underused in the past and is infrequently utilized for diagnosis or preoperative assessment. We report a case of benign chondroid syringoma of the upper lip, initially diagnosed by FNAC and later confirmed by histopathology. A literature review on the topic has also been done. The key words “chondroid syringoma” and “pleomorphic adenoma” were used to search databases which included PubMed, Google Scholar, Cochrane library and Hinari, and relevant papers were retrieved.

Case presentation

A 44-year-old male presented with an asymptomatic, progressive swelling over the left half of his upper lip of 2-years duration. The swelling was initially small and had gradually increased to present dimensions. There was no history of trauma, discharge or any other similar lesion in the body. There was no history of symptoms suggestive of systemic illnesses. On examination, there was a firm, non-fluctuant, skin coloured, non-tender nodule of size 1.5 cm × 1.5 cm with overlying normal skin (Figure 1). The nodule was fixed to the skin, but freely mobile over underlying structures. There was no regional lymphadenopathy.
FNAC of the lesion was done which showed aggregates, acini and singly scattered benign epithelial cells along with myoepithelial cells and chondromyxoid stromal fragments (Figure 2). Epithelial cells were round to polygonal with basophilic dense moderate cytoplasm and central to eccentric, round to oval nuclei with bland chromatin on a background of myxoid material, thus pointing towards the possibility of chondroid syringoma (Figure 3A and B).

The nodule was excised and the whole specimen was sent for histopathological examination. The cut section showed homogenous grey white areas. The hematoxylin-eosin stain revealed cystic structures with cystically dilated ducts, nests and glandular structures lined by bland looking epithelial cells along with surrounding chondromyxoid stroma (Figure 4A and B). Histopathology confirmed the cytological diagnosis of CS. Immunohistochemistry could not be done because of unavailability in the centre. Excision site was healthy during the postoperative period and no recurrence was observed after 6 months of follow-up.

**Discussion**

CS is a benign cutaneous tumor with male preponderance (male to female ratio of 5:8), and is predominantly seen on head and neck regions with predilection for upper lips, nose and cheeks. Rare sites on the face include the orbit, eyelids, and medial canthus. Other uncommon sites are the back, axilla, thighs, extremities and genitalia. The tumor presents as an asymptomatic, solitary, skin coloured, firm, and non-tender slow growing nodule. A tumor in the orbit may lead to exophthalmos. The size ranges from 0.3 cm to 3 cm. Nodules exceeding 5 cm and 10 cm in diameter have also been reported. The clinical profiles of CS from five large retrospective studies are compared in Table 1.

**Figure 1** A 1.5 cm diameter nodule on left half of upper lip before excision.

**Figure 2** FNAC: aggregates, acini and single scattered benign epithelial cells along with myoepithelial cells and chondromyxoid stromal fragments (Giemsa stain, ×40).

**Abbreviations:** FNAC, fine needle aspiration cytology.

**Figure 3** (A) FNAC smear showing sheet of myoepithelial cells with basophilic dense cytoplasm and central to eccentric, round to oval nuclei with bland chromatin (Giemsa stain, ×200). (B) Cluster of epithelial cells with scattered myoepithelial cells in a chondromyxoid background (Giemsa stain, ×200).

**Abbreviations:** FNAC, fine needle aspiration cytology.
Because of its rarity, asymptomatic and subcutaneous nature, the clinical diagnosis of this condition is often missed as evidenced by the diagnoses made before histopathological examination revealed in Table 2. The differential diagnosis of such presentations include dermoid or sebaceous cyst, pilar cyst, calcifying epithelioma, or a solitary trichoepithelioma, dermatoibroma, lymph node, hamartoma, basal cell carcinoma, and seborrheic keratosis, with no role of non-invasive investigations like X-ray, ultrasonography, MRI, or CT scan in the diagnosis. FNAC and biopsy so far remains the gold standard for the diagnosis. FNAC which is easy to perform, is established in the literature for making early diagnosis of CS and is reviewed in Tables 2 and 3.

The origin of CS is from both secretory and ductal segments of eccrine or apocrine sweat glands. It is a mixed tumor with epithelial and mesenchymal components and resembles the pleomorphic adenoma of salivary glands. The first attempt to diagnose and document CS on FNAC was made in 1988 by Masood et al. The aspirate can be thick, mucoid and sometimes gelatinous with moderate cellularity. Thin aspirate may be associated with scanty stromal elements. The mucoid material stains positive with alcian blue and mucicarmine. The epithelial cells arrangement is highly variable. The cells can appear singly, scattered, in groups or as sheets, attached either loosely or cohesively. As in our case, acini and papillary configurations have also been noted. The individual cells are small to medium sized, well-defined, monomorphic, round-to-oval-to-ovoid-to-polygonal, with moderate to dense cytoplasm. The cytoplasm can be eosinophilic to amphophilic, imparting a plasmacytoid appearance. The nuclei are small, monomorphic, round, oval, ovoid or elongated, central to eccentric in location with fine, evenly distributed chromatin. Nuclear atypia is a rare finding without any propensity to develop into malignancy. Anisonucleosis, conspicuous nuclei or nuclei with clear halos may be suggestive of neoplastic changes, but malignancy can be safely ruled out in the absence of other features. The background is chondroid, myxoid, or chondromyxoid which can be scant to abundant. Myoepithelial cells also appear in clusters or aggregates, dispersed along with epithelial cells in the stroma, and give plasmacytoid appearance with dark nuclei. Macrophages are uncommonly seen and have been reported along with cystic changes by Khan et al. In our case, foamy macrophages were evident on a myxoid background but without any cystic changes. Immunostaining differentiates the two components, as epithelial membrane antigen (EMA) and cytokeratin stains the epithelial cells, while S-100 makes the myoepithelial part evident.

Cytology in addition to clinical features like site and size, can be a tool to differentiate benign from malignant CS. Rarely, a benign tumor may turn aggressive and go into malignant phase. Poor prognosis, metastasis and recurrences following excision are attributes of malignant CS. The clinical features that differentiates it from benign CS include female preponderance, predilection for extremities and size exceeding 3 cm. Studies describing FNAC findings of malignant CS are also scarce. In 1997, Mishra et al made the first conclusive diagnosis of malignant CS on FNAC. Haemorrhagic aspirate, hypercellularity, pleomorphic epithelium, dyskinesis of cells, intranuclear and intracytoplasmic vacuolation, and pericellular halo were the characteristic findings. Histopathology confirmed the diagnosis. A recent attempt to diagnose malignant CS on a recurrent lesion by FNAC was made in 2016 by Shobhanaa et al. The cytology

Figure 4 (A) Section showing tumor composed of ducts and glandular structures lined by bland looking epithelial and myoepithelial cells with surrounding chondromyxoid stroma (H&E stain, ×40). (B) Focal areas showing ossification and keratinous cyst filled with keratin (H&E stain, ×40).

Abbreviations: H&E, hematoxylin and eosin.
Table 1 Comparison of the clinical features of CS lesions in five large studies

|                           | Hirsch and Helwig 1961 | Bekerecioglu et al 2002 | Yavuzer et al 2003 | Salama et al 2004 | Ayala-Cortes et al 2015 |
|---------------------------|------------------------|-------------------------|-------------------|------------------|------------------------|
| Period                    | Not mentioned          | 1995–2001               | 1986–2002         | 1985–1997        | 1997–2014              |
| No. of cases              | 188                    | 13                      | 16                | 25               | 19                     |
| Male/females (M:F ratio)  | 145/40 (3.5:1)         | 5/8                     | 10/6              | 14/11            | 14/5                   |
| (range)                   | Unknown: 3             | (1:1.6)                 | (1.6:1)           | (1.2:1)          | (2.8:1)                |
| Mean age (range)          | Not mentioned          | 33.1 years              | 42.8 years        | 55 years         | 50 years               |
| Mean size (range)         | Not mentioned          | 2.01 cm                 | Not mentioned     | 0.5 cm           | 0.9 cm                 |
| Sites                     | Head and neck          | 150                     | 10                | 15               | 16                     |
|                           | Axilla and chest       | 9                       | 0                 | 0                | 0                      |
|                           | Trunk                  | 8                       | 1                 | 0                | Others: 9              |
|                           | Extremities            | 19                      | 2                 | 1                | 2                      |
|                           | Genitalia              | 2                       | 0                 | 0                | 0                      |
| No. of lesions            | Single (except one case)| Single               | Single            | Single           | Single                 |
| Most common clinical diagnosis | Sebaceous cyst or cyst | Not mentioned         | Dermal cyst       | Not mentioned   | Cystic lesions or adnexal tumors |
| FNAC done                 | No                     | No                     | No                | No               | No                     |
| Treatment                 | Excisional biopsy      | Excisional biopsy      | Excisional biopsy | Excisional biopsy | Excisional biopsy      |

Abbreviations: FNAC, fine needle aspiration cytology.
Table 2 Clinical findings and original diagnoses of cases which underwent FNAC

| Age (years)/gender | Site                  | Size (cm)   | Duration (years) | Clinical diagnosis | Cytological diagnosis | Histopathological diagnosis |
|-------------------|-----------------------|-------------|------------------|--------------------|-----------------------|-----------------------------|
| Masood et al 1988 | Left thigh            | 5×4         | 5                | NM                 | CS                    | CS                          |
| Srinivasan et al 1993 | Right shoulder         | 2.5         | 3 months         | Neurofibroma       | CS                    | CS                          |
| Gottschalk-Sabag et al 1994 | Axilla            | 0.5×3       | NM               | Metastatic lymph node | Probable CS            | CS                          |
| Kumar et al 2003  | Nape of the neck      | 5×5×3       | 2                | Hamartoma          | Benign appendageal tumor of the skin | CS |
| Siddaraju et al 2009 | Dorsum of the nose    | 0.8×0.8     | 1                | Basal cell carcinoma | CS                    | CS                          |
| Kumar 2010       | Dorsum of the nose    | 2×2         | NM               | Dermoid cyst       | CS                    | CS                          |
| Skoro et al 2010  | Neck                  | 0.8         | 5                | NM                 | CS                    | CS                          |
| Dubb et al 2010   | Scalp                 | 2           | NM               | NM                 | Suggestive of CS      | CS                          |
| Tokyol et al 2010 | Upper lip             | 0.5         | 10               | Lipoma             | Benign appendageal tumor | CS |
| Nasit et al 2012  | Mastoid               | 1.2 cm      | 3                | None               | CS                    | CS                          |
| Narasimha et al 2013 | Lower back           | 12×8×5      | 3                | NM                 | CS                    | CS                          |
| Khan 2013        | Left supraorbital region | 3×2.5     | NM               | Sebaceous or epidermal cyst | Benign cystic neoplasm possibly benign skin adnexal tumor | CS |
| Pal et al 2014    | Left forearm          | 2×1.5       | 1½               | NM                 | CS                    | CS                          |
| Barman et al 2016 | Right thumb           | 3.5         | 2                | NM                 | NM                    | CS                          |
| Rogers et al 2016 | Right axilla          | 1           | 1                | Lymph node or cyst | Benign epithelial-mesenchymal biphasic neoplasm | CS |
| Mahantappa et al 2016 | Anterior abdominal wall | 8×6×5     | 1½               | Dermoid cyst       | CS                    | CS                          |
| Lamba et al 2017  | Left arm              | 2.5×2       | 1                | Epidermal inclusion cyst | Sebaceous cyst and dermatofibroma | CS |
| Our case 2018    | Upper lip             | 1.5×1.5     | 6                | CS                 | CS                    | CS                          |

Abbreviations: CS, chondroid syringoma; FNAC, fine needle aspiration cytology; NM, Not mentioned.
**Table 3** Detail cytological findings of cases which underwent FNAC

| Study            | Aspirate | Cellularity | Epithelial cell arrangement       | Individual cells                                                                 | Nuclei                                                                 | Myoepitheliod cells | Background/ Stroma |
|------------------|----------|-------------|-----------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------|--------------------|
| Masood et al 1988<sup>17</sup> | NM       | Moderate    | Clusters and sheets               | Small cells with relatively scant, faintly eosinophilic cytoplasm               | Small ovoid-to-elliptical with finely granular chromatin, occasional small chromocenters | NM                  | Chondroid          |
| Srinivasan et al 1993<sup>22</sup> | NM       | NM          | NM                                | Round to oval cells with a moderate amount of cytoplasm                        | Monomorphic nuclei                                                  | Some spindle-shaped cells | (Abundant)         |
| Gottschalk-Sabag et al 1994<sup>19</sup> | NM       | NM          | Single, groups and tubular configuration | Clusters of epithelial                                                             | Round and monomorphous with moderate to abundant amount of cytoplasm | NM                  | Myxoid             |
| Kumar et al 2003<sup>21</sup> | Thick, mucoid and gelatinous | NM       | NM                                | More monomorphic with moderate to abundant amount of cytoplasm                 | Monomorphic, with fine chromatin                                      | In clusters         | Metachromatic, chondromyxoid |
| Siddaraju et al 2009<sup>14</sup> | NM       | Moderate    | Clusters as well as dispersed      | Round to polygonal with moderate to abundant cytoplasm                         | Oval, vesicular with mild to moderate anisonucleosis                 | NM                  | Relatively pale-stained, cyano-philic to eosinophilic ground substance |
| Kumar 2010<sup>15</sup> | Mucoid   | NM          | Clusters                           | Round with moderate to abundant cytoplasm                                       | Monomorphic, centrally located                                       | NM                  | Chondromyxoid       |
| Skoro et al 2010<sup>16</sup> | Bloody   | NM          | Clusters and papillary formations  | Well defined with dense, moderate cytoplasm                                     | Fine chromatin                                                        | NM                  | Chondromyxoid       |

(Continued)
Table 3 (Continued).

| Aspirate | Cellularity | Epithelial cell arrangement | Individual cells | Nuclei | Myoepitheliod cells | Background/ Stroma |
|----------|-------------|----------------------------|-------------------|--------|--------------------|-------------------|
| Dubb et al 2010[20] | NM | NM | Sheets, clusters and single cells | Well defined with moderate eosinophilic to amphophilic cytoplasm imparting a plasmacytoid appearance | Bland, round to oval, eccentrically located | NM | Eosinophilic myxoid |
| Tokyo et al 2010[18] | NM | Hypercellar | Cohesive groups of cells | Monomorphic round cells with moderate to abundant amount cytoplasm | Mono morphic nuclei with fine chromatin. Some nuclei were eccentrically placed, like plasmacytoid cells | Spindle cells seen | Chondromyxoid |
| Nasit et al 2012[27] | Thick and mucoid | NM | Sheets and loose clusters with a few single cells | Bland, small and monomorphic with moderate amount of cytoplasm | Round to oval, centrally located | Evenly dispersed fine chromatin | Elongated | Chondromyxoid |
| Narasimha et al 2013[12] | Thick, mucoid, and gelatinous | NM | Loose cohesive clusters and discrete | Round to oval with moderate to abundant cytoplasm | Centrally located nuclei having fine chromatin, a few showing one to two prominent nucleoli | NM | Chondromyxoid |
| Khan 2013[18] | Thin fluid-like | Moderate | Cohesive clusters | Medium-sized cells with moderate to abundant amount of cytoplasm | Bland appearing monomorphic centrally placed or slightly eccentric nuclei with fine chromatin | Smaller hyperchromatic | Chondromyxoid (Scant) |
| Pal et al 2014[28] | Thick mucoid | Moderate | Clusters | Monomorphic, round to oval, medium sized having moderate amount of cytoplasm | Bland round to oval with finely dispersed chromatin | Small cells having plasmacytoid appearance with dark nuclei | Chondromyxoid (Abundant) |

(Continued)
revealed hypercellularity and tissue fragments of malignant-appearing round-to-polygonal cells. The biopsy was inconclusive. A repeat FNAC was performed, along with immunocytochemistry. Vacuolation, in distinct cell borders, nuclear pleomorphism and multiple prominent nucleoli were appreciated. Pan cytokeratin, EMA, S-100, calponin, and α-smooth muscle actin showed strong positivity, which sealed the diagnosis.

Excision is the treatment of choice and should include the margins. In 1961, Hirsch and Helwig proposed the histological criteria for diagnosis of CS. Apocrine CS exceeds the number of eccrine CS reported. The apocrine variant has two rows of epithelial cells lining the tubular and cystic branching lumina, while the smaller lumen in eccrine type has a single row of cells. The presented case belonged to the former group.

### Conclusion
CS is a rare tumour presenting in dermatological practice. FNAC is a very useful tool for making preliminary diagnosis of CS before making a large excision. However, the final diagnosis is based on histopathological examination.

### Ethical statement
The patient gave his written informed consent for the publication of images and information. Institutional approval was not required to publish the case details.
Disclosure

The authors report no conflicts of interest in this work.

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