

# Granular Cell Tumor – Clinically Presented as Lymphadenopathy

Branka Lončar<sup>1</sup>, Ksenija Marjanović<sup>2,3</sup>, Biljana Pauzar<sup>1,3</sup> and Blaženka Staklenac<sup>2</sup>

<sup>1</sup> Department of Clinical Cytology, University Hospital Center Osijek, Osijek, Croatia

<sup>2</sup> Department of Clinical Pathology and Forensic Medicine, University Hospital Center Osijek, Osijek, Croatia

<sup>3</sup> University of Osijek, School of Medicine, Osijek, Croatia

## ABSTRACT

*Granular cell tumors are relatively uncommon benign lesions occurring in almost any part of the body. We report the cytological diagnosis of granular cell tumor in 25-year-old male patient who presented with an inguinal mass clinically suspected to be a lymphadenopathy. Fine needle aspiration revealed polygonal cells with abundant, granular cytoplasm and eccentrically located vesicular nuclei and inconspicuous nucleoli. The histopathological examination of the surgical excision confirmed the diagnosis. If resection is complete, local surgical excision is curative for benign granular cell tumors. Granular cell tumor has a characteristic cytological appearance, and fine-needle aspiration cytology has been suggested to be diagnostic modality of choice.*

**Key word:** granular cell tumor, fine-needle aspiration, case report

## Introduction

Granular cell tumor (GCT) was first described by Abrikosoff in 1926 and postulated a myogenic origin and termed it as a granular cell myoblastoma<sup>1</sup>. GCTs are now generally believed to have a neural (probably the Schwann cell) precursor based on histochemical, immunohistochemical and ultrastructural findings<sup>2</sup>.

Although most frequently involving the skin, subcutaneous tissue<sup>3–5</sup> and tongue<sup>6</sup>, there are reports of cytological description of GTCs involving breast<sup>7,8–10</sup>, mediastinum<sup>11</sup>, bronchial mucosa<sup>7</sup>, parotid gland<sup>12</sup>, oesophagus<sup>13</sup>, vulva<sup>14</sup> and central nervous system<sup>15</sup>. We report the case of this tumor in inguinal region, and to our knowledge, there has been no similar cases in medical literature.

## Case Report

A 25 year old male presented at our Department with swelling in left inguinal region of 6 month duration. He was in very good physical condition, without pain, fever or signs of inflammation on left leg.

On clinical examination, a single, firm, mobile nodular tumor about 3 cm in size was palpable in left inguinal

region, suspected to be lymphadenopathy. The tumor was sampled by fine-needle aspiration (FNA) biopsy, fixed immediately in 96% ethanol, air dried and stained by Papanicolaou and May-Grünwald-Giemsa method.

FNA smears were highly cellular, composed of clusters and single, fairly uniform, polygonal cells with abundant, finely granular cytoplasm and eccentric round to slightly oval nuclei (Figure 1), which was particularly prominent on alcohol fixed preparations (Figure 2). The cells were fragile, with stripped nuclei in a background of finely granular material. Occasional cells with nuclear pleomorphism and conspicuous nucleoli were identified (Figure 3). There was no evidence of necrosis or mitotic activity. A cytologic diagnosis of benign GCT was made and excision was advised.

Histopathological examination of the excised tissue revealed a circumscribed tumour composed of cells in nests incorporated in subcutaneous fat tissue. The cells were large, polygonal with granular eosinophilic cytoplasm, with round nuclei. Moderate nuclear pleomorphism and indistinct nucleoli were evident (Figure 4). Immunohistochemistry revealed strong cytoplasmic reaction for S-100 protein (Figure 5). The cells were nega-

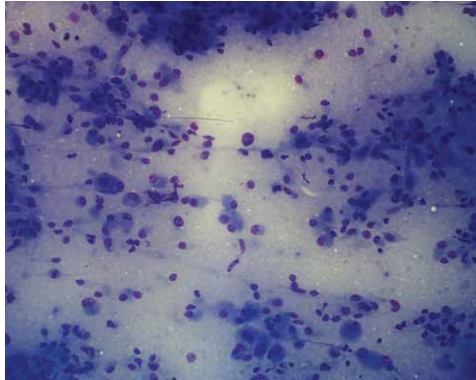


Fig. 1. A highly cellular FNA smear composed of clusters and single, fairly uniform polygonal cells with abundant cytoplasm and eccentric round to slightly oval nuclei. May-Grünwald-Giemsa, x200.

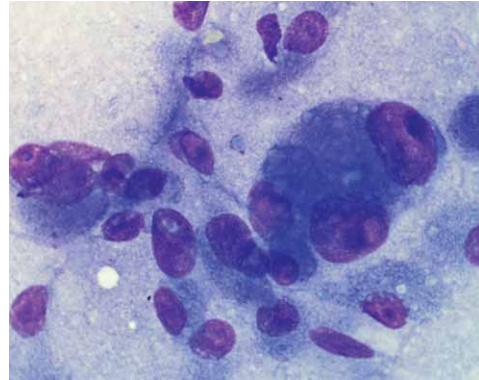


Fig. 3. The tumor cells have occasional polymorphism and prominent nucleoli compatible with benignancy. May-Grünwald-Giemsa, x200.

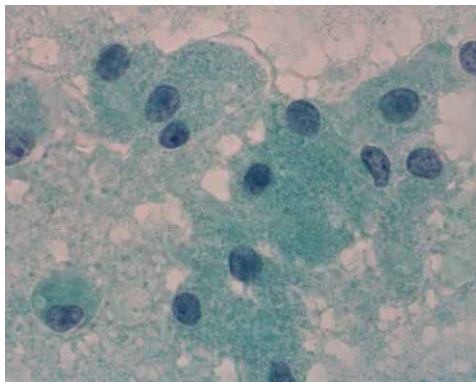


Fig. 2. Finely granular cytoplasm is particularly prominent on alcohol fixed preparations. Papanicolaou, x1000.

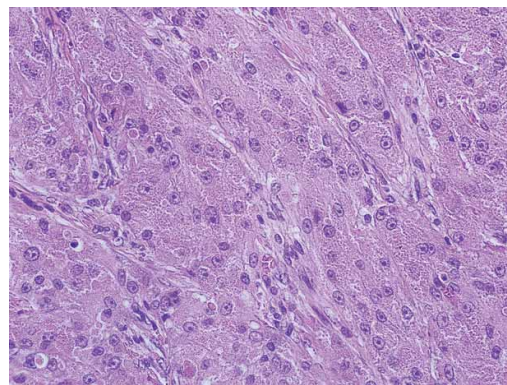


Fig. 4. The tumor cells have large, eosinophilic, fine granulated cytoplasm with eccentrically located vesicular nuclei. Hematoxylin, eosin x400.

tive for cytokeratin, CD 68, HMB-45 and NSE. The diagnosis of benign GCT was confirmed. The patient is well after 7 months of follow-up.

## Discussion

GCTs are typically nonulcerated, solitary, painless nodules with slow growth rate, smaller than 3 cm<sup>2</sup>. The leading clinical diagnoses of GCTs are lipoma, lymphadenopathy and fibromatosis. The cause of granular cell tumors is unknown. Debate about their histogenesis persists for years. Early observation attributed these tumors to myoblastic cells, and so they were called granular cell myoblastoma. Succeeding reports have variously suggested mesenchymal, fibroblastic, or histiocytic derivations. Favored today is nerve sheath derivation supported by the strong S-100 protein expression immunohistochemically and prominent basal lamina and intracytoplasmic filaments ultrastructurally. The tumor cells are nonimmunoreactive for epithelial, muscle, endothelial and glial cell markers. This is useful for differentiating a granular cell tumor from other diagnostic possibilities<sup>2,7</sup>.

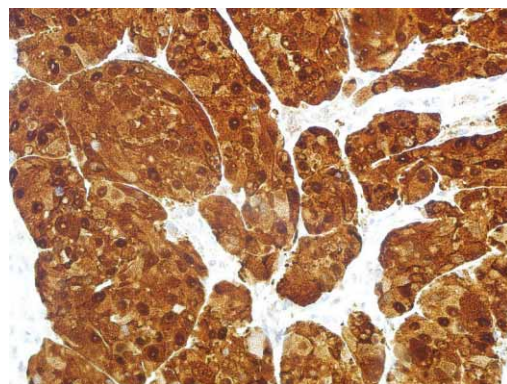


Fig. 5. The tumor cells react strongly with antibodies against S-100 protein. x400.

They may occur at any age, most often in young to middle-aged adults with no sex preponderance. They have occurred in almost every site in the body and can occur in virtually any location, although easily noticed surface lesions located in the dermis or subcutis (ie, head, neck, trunk, extremities).

GCTs are also found in the internal organs, particularly in the upper aerodigestive tract. Benign GCTs are

not uncommon, but malignant ones are rare and at times difficult to diagnose. The latter are rare, comprising fewer than 2% of all granular cell tumors<sup>2,16</sup>. Microscopic features of benign GCT are remarkably uniform regardless of the site. Benign GCT has distinctive cytomorphic appearance that permits its diagnosis on FNA. The smears usually highly cellular and characterized by polygonal cells in cohesive groups as well as single cells, with eccentric, round-to slightly oval nuclei and abundant, finely granular cytoplasm which was particularly prominent on alcohol fixed preparations. The granularity of the cytoplasm is caused by a massive accumulation of lysosomes. The cells are fragile, with stripped nuclei in a background of finely granular material. Occasional cells with nuclear polymorphisms and small-but-conspicuous nucleoli were identified<sup>2,4,7,15,17</sup>. Liu et al. cautioned that occasional nuclear polymorphisms and prominent nucleoli were compatible with benignancy<sup>17</sup>.

In general, these reports are consistent with our experience with the range of cytologic findings in benign GCTs.

Malignant GCT tumors are extremely rare and usually large and deep-seated. Features which have been considered to suggest malignancy are necrosis, a predominance of spindly tumour cells, cellular pleomorphism,

prominent nucleoli and mitoses<sup>2,7,18</sup>. Wide en bloc excision is recommended for malignant lesions<sup>2</sup>.

Granular cells are not unique to GCTs. Cytoplasmic granularity typical of GCT has been observed in neoplastic and in nonneoplastic conditions. Morphologically, the differential diagnoses of benign GCT include inflammatory lesions with numerous histiocytes, fibrous histiocytoma, oncocytic neoplasms, neuroendocrine tumors, granular renal cell carcinoma, leiomyosarcoma, melanoma and ameloblastoma<sup>2,4</sup>. Some schwannomas and neurofibromas may show granular changes in parts, although the changes are never extensive enough to create a major diagnostic challenge. Benign granular cell tumors may exhibit some superficial resemblance to rhabdomyomas<sup>19</sup>. A battery of immunohistochemical stains is needed to make a specific diagnosis<sup>2</sup>.

## Conclusion

If resection is complete, local surgical excision is curative for benign granular cell tumors. Even in the absence of ancillary studies, cytomorphological features are distinctive enough to allow a confident cytological diagnosis of GCT, irrespective of the site.

## REFERENCES

1. ABRIKOSSOFF A, Virchows Arch Pathol Anat, 260 (1926) 215. —
2. OSIPOV VO, SHIDHAM VB, Granular Cell Tumors, Emedicine, accessed 8.4.2009. Available from: URL: <http://emedicine.medscape.com/article/282430-overview>. —
3. MALLIK MK, DAS DK, FRANCIS IM, AL ABDULGHANI R, PATHAN SK, SHEIKH ZA, LUTHRA UK, Acta Cytologica, 45 (2001) 263. —
4. GUPTA R, SINGH S, JAIN S, MANDAL K, Cytopathology, 16 (2005) 318. —
5. SALTO TELLEZ M, SAUNDERS C, KOCJAN G, Cytopathology, 11 (2000) 191. —
6. NAGARAJ PB, ONGOLE, R, BHUJANGA RAO BR, Med Oral Patol Oral Cir Bucal, 11 (2006) 162. —
7. WIECZOREK TJ, KRANE JF, DOMANSKI HA, AKERMAN M, CARLEN B, MISDRAJI J, GRANTNER SR, Cancer Cytopathology, 93 (2001) 398. —
8. AKATSU T, KOBAYASHI H, UEMATSU S, TAMAGAWA E, SHINOZAKI H, KASE K, KOBAYASHI K, OTSUKA S, MUKAI M, KITAJIMA M, Surg Today, 34 (2004) 760. —
9. GIBBONS D, LEITCH M, COSCIA J, LINDBERG G, MOLBERG K, ASHFAQ R, SABOORIAN

- MH, Breast J, 6 (2000) 27. —
10. ROSSI ED, MULE A, MIRAGLIA A, CIANFRINI F, ZANNONI GF, FADDA G, Cytopathology, 16 (2005) 259. —
11. SMITH AR, GILBERT CF, STRAUSBAUCH P, SILVERMAN JF, Cytopathology, 15 (2004) 119. —
12. CHAE SW, SOHN JH, SHIN HS, Acta Cytol, 46 (2002) 550. —
13. PREMATTILLEKE IV, PIRIS J, SHSH KA, Cytopathology, 15 (2004) 120. —
14. HALE, JL, SCHWENK GR, WILSON DB, MORIARTY AT, CRABTREE WN, Acta Cytol, 46 (2002) 373. —
15. POLICARPIO-NICOLAS MLC, LEE BH, MANDELL JW, LOPES BMS, Diagn Cytopath, 36 (2008) 58. —
16. COTRAN RS, KUMAR V, ROBBINS SL, Pathologic Basis of Disease (WB Saunders Company, Philadelphia, 1989). —
17. LIU K, MADDEN, OLATIDOYA BA, DODD LG, Acta Cytol, 43 (1999) 552. —
18. AKERMAN M, DOMANSKI HA, The Cytology of Soft Tissue Tumours (Karger, Basel, 2003). —
19. JIN B, SALEH H, Diagn Cytopathol, 13 (2009) 483.

B. Lončar

Department of Clinical Cytology, University Hospital Center Osijek, J. Huttlera 4, 31000 Osijek, Croatia  
e-mail: loncar.branka@kbo.hr

## GRANULAR CELL TUMOR

### SAŽETAK

Granular cell tumor je relativno neuobičajena dobroćudna promjena koju je moguće naći na bilo kojem dijelu tijela. Autori prikazuju bolesnika sa tvorbom u preponi za koju se posumnjalo da je povećani limfni čvor. Citološkom punkcijom su nađene poligonarne stanice obilne zrnate citoplazme sa ekscentrično smještenim vezikularnim jezgrama i nezamjetnim nukleolima. Histopatološki pregled odstranjene tvorbe je potvrdio citološku dijagnozu. Resekcija tvorbe je i jedini terapijski postupak za dobroćudne granular cell tumore. Zbog karakteristične citološke slike granular cell tumora, citološka punkcija je metoda izbora u njegovoj dijagnostici.