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## Myoblastoma of the breast: Our experience and review of literature

A. Sanguinetti<sup>a,\*</sup>, A. Polistena<sup>b</sup>, R. Lucchini<sup>a</sup>, M. Monacelli<sup>c</sup>, S. Galasse<sup>b</sup>, S. Avenia<sup>d</sup>,  
W. Bugiantella<sup>b</sup>, R. Triola<sup>a</sup>, R. Cirocchi<sup>b</sup>, F. Rondelli<sup>b</sup>, N. Avenia<sup>b</sup>

<sup>a</sup> S. Maria University Hospital, Terni, Italy

<sup>b</sup> University of Perugia, Italy

<sup>c</sup> Perugia University Hospital, Italy

<sup>d</sup> Medical School University of Perugia, Italy

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### ABSTRACT

**INTRODUCTION:** Breast myoblastoma or granular cell tumor involving the breast parenchyma has been described in detail for the first time since Abrikosoff in 1931. The location of this injury to the breast is very rare, accounting for between 5% and 15% of all cases of cancer of the granular cells. We present our experience regarding the identification of two cases because of the relative rarity of this tumor. It is often confused with breast cancer on clinical and radiological, and its diagnosis can then be difficult for physicians, radiologists and pathologists.

**PRESENTATION OF CASES:** We report the cases of two young women who came to our attention because of the presence of mass shoveled breast, mobile and accompanied by pain cycle independent. In both cases, mammography and ultrasound revealed the presence of heterogeneous mass and irregular, but in one of two such mass located at the Union of external quadrants of the left breast and was in contact with his serratus anterior and suspicion for malignancy. In both cases the 'histology combined with immunohistochemical study proved to be a granular cell tumor.

**CONCLUSION:** Although a granular cell tumor of the breast is a rare tumor breast, should be considered in the differential diagnosis of benign and malignant lesions. Surgeons and pathologists should keep in mind when considering a granular cell tumor cells with abundant granular cytoplasm containing materials to avoid misdiagnosing breast cancer, which could lead to unnecessary surgery.

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### 1. Introduction

The myoblastoma is a granular cell tumor (GCT), rare, and described for the first time by Weber in 1854. It is been fully described by Abrikosoff in 1926; who suspected a myogenic origin and therefore defined a granular cell myoblastoma. However, due to S-100 protein positivity and the similarity of the tumor cells to the Schwann cells, researchers have proposed that the tumor originated from Schwann cells; the exact histogenesis of this tumor is still unknown [1–4]. Born in general in the language but can occur at any place and at any age, and may be multifocal. Abrikosoff

was in 1931 to describe the first case of involvement of the breast parenchyma [2]. Localization of this injury to the breast is very rare, accounting for between 5% and 15% of all cases GCT [1,2]. Although GCT is well-established entity, is often confused with clinical examination and radiological breast cancer. Its diagnosis is a challenge for physicians, radiologists and pathologists [1,5]. We report two cases of a GCT mimicking breast cancer on mammography and ultrasound. The diagnosis was made by histological examination. Through this observation, we discuss aspects of radioclinical, histopathological and treatment of this rare tumor, as well as the results.

#### 1.1. Presentation first case

We report the case of a 36-year-old woman came to our attention with a palpable mass in her left breast appearance from about 18. She had a personal or family history of cancer. A physical examination showed a mass of 17 mm, painless, located to the union of the outer quadrants of the left breast, without skin changes or axillary node involvement. Mammography revealed a dense mass with ill-defined edges. The ultrasound showed a hypoechoic, heterogeneous, irregular and poorly limited mass 17 mm, located at

\* Corresponding author at: UOC Chirurgia Generale e Specialità Chirurgiche, S. Maria University Hospital, via Tristano di Joannuccio 1, Terni 05100, Italy. Fax: +39 0774365147.

E-mail addresses: [alessandroanguinetti@gmail.com](mailto:alessandroanguinetti@gmail.com), [sanguinettiale@gmail.com](mailto:sanguinettiale@gmail.com) (A. Sanguinetti), [apolis74@yahoo.it](mailto:apolis74@yahoo.it) (A. Polistena), [robertalucchini@alice.it](mailto:robertalucchini@alice.it) (R. Lucchini), [massimo.monacelli@gmail.com](mailto:massimo.monacelli@gmail.com) (M. Monacelli), [sergio.galasse@gmail.com](mailto:sergio.galasse@gmail.com) (S. Galasse), [stefano.avenia@libero.it](mailto:stefano.avenia@libero.it) (S. Avenia), [walterbugiantella@alice.it](mailto:walterbugiantella@alice.it) (W. Bugiantella), [triolaroberta@gmail.com](mailto:triolaroberta@gmail.com) (R. Triola), [rondellif@hotmail.com](mailto:rondellif@hotmail.com) (R. Cirocchi), [rondellif@hotmail.com](mailto:rondellif@hotmail.com) (F. Rondelli), [nicolaavenia@libero.it](mailto:nicolaavenia@libero.it) (N. Avenia).

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the Union of external quadrants of the left breast, to the serratus muscle. The mass was suspicious of malignancy (Fig. 1). Gross examination, the tumor was 19 mm at its largest diameter, whitish in color and had boundaries are not well defined. Microscopic examination revealed a benign tumor composed of compact nests of polygonal cells with well-defined edges phones that contained granular eosinophilic cytoplasm, and small, uniform, round nuclei without nuclear pleomorphism or mitotic activity (Figs. 2 and 3). The immuno-histochemical analysis showed positivity for S-100 protein (Fig. 4). The cells were negative for cytokeratin and cluster of differentiation (CD) 163. Based on these data, it was confirmed the diagnosis of GCT.

### 1.2. Presentation second case

The second case was that of a young woman of 30 years, came to our attention because of the presence of right breast lump, appeared to be about 12 months and accompanied by not cyclical pain. Mammography and ultrasound revealed a mass within definite suspicion of fibroadenoma. The patient had no previous operations and no pregnancies, and there was no family history of breast cancer. FNAC of nodule did not allow a correct and definitive diagnosis, and the patient has undergone surgery lumpectomy. The operation and the postoperative period were quiet. To date, there is no recurrence of the lesion. Gross examination the material was composed of nodule 27 mm centimeters in diameter and the surrounding breast tissue. Macroscopically fragment appeared as solid tumor gray-white and other fragments were recognized as breast tissue. Microscopically observed a benign tumor. The tumor was composed of compact nests and sheets of cells with the edges of the cells that contain well-defined cytoplasmic eosinophils granules. The cells were fused polygonal in shape. The nuclei are round or slightly oval, and some of them contain prominent nucleoli (Figs. 1 and 2). In different focuses mostly on the periphery of the lesion lymphoplasmocytic prominent infiltration is observed. Rarely in the suburbs, nerve bundles were seen. Mainly, the tumor was well defined, however, focuses infiltrative growth existed (Figs. 3 and 4). Normal breast tissue around the lesion persisted (Fig. 5).

## 2. Discussion

A GCT is a rare tumor that may arise throughout the body. The site anatomical organ of origin is the most common language, followed by soft tissue [1,4,6]. GCT breast represents between 5% and 15% of all cases GCT [2]. It occurs in a wide range of ages, from teenagers to the elderly, but most commonly occurs in women between 30 and 50 years of age. However, some cases of GCT of the breast have been described in humans [1,4,6]. Usually presents as painless mass, well-circumscribed, and generally furniture. Several cases have been reported with poorly circumscribed masses that may be attached to the pectoral muscle, mimicking malignancy [1,2]. Involvement of the skin, including the thickening, tethering, dimples and retraction, has been described [2]. The tumor is solitary, but multiple lesions (multifocal) were reported from 5% to 18% of cases [4,6]. In one of our patients, the tumor was poorly limited and was in contact with the muscles of the chest wall. GCT breast stem from intra-lobular breast stroma. They show no preference side [2,6,7]. Occur more frequently in the upper quadrants of the breast, in accordance with breast cancer, which generally is located in the upper outer quadrant. However, a case analysis aroused a great variety of positions, including the upper outer quadrant, the upper inner quadrant, the tail axillary, the median line, the nipple and the retroareolar region [1,2]. The histogenesis of GCT remains controversial and its unknown etiology. When Abrikosoff first described the type of tumor is assumed to originate in skeletal

muscle [2]. Chung and Work have suggested an origin smooth muscle [8]. Then it was thought that their origin was from fibroblasts or undifferentiated mesenchymal cells or histiocytes and Ulrich et al. showing proof of histiocytic [9]. Furthermore, immunohistochemical profiling suggests that it is unlikely to be of muscle (due to the negativity for alpha-smooth muscle actin) or epithelial (because of the negativity for keratin or epithelial membrane antigen) origin [10]. Subsequently, other studies have established that these tumors originate from Schwann cells due to their S-100 protein positivity and the similarity of the tumor cells of Schwann cells [3]. The presentation of GCT on imaging diagnostic breast is variable. In mammography, has often been described as a small (<3 cm) lesion, ranging from a round, well-circumscribed mass, an indistinct or spiculated lesion missing calcifications, difficult to distinguish from carcinoma [4–6]. On ultrasound, can present as a solid, little injury marginata, with strong shadow back, suggestive of cancer, or as a more benign appearance of well-circumscribed mass [1,4,6]. A gross section usually shows a firm or hard, smooth, gray-white to yellow tumor, measuring generally three centimeters or less, but were reported tumors measuring up to 6 cm. The majority of these tumors appears to be well-circumscribed, but in other cases the margins are poorly defined and can infiltrate, as in one of our cases, the surrounding tissues, in particular fibrous tissue, adipose tissue and the muscle serratus. These features mimic malignant growth patterns and give the impression of infiltrating carcinoma variant scirrosa [1,2,6,7]. Clinical examination and X-ray, it is impossible to establish a definitive diagnosis of GCT free breast biopsy. Sonographically guided percutaneous biopsy of the lesion is well established as the diagnostic procedure of choice for sampling histopathology [7]. Under the microscope, the tumor is well circumscribed, but may have infiltrative margins, as indicated in our case. The cells are arranged in nests and sheets. Are generally uniform, big, bland and polygonal. However, rarely can be round or spindle-like form [1,2]. Have distinct edges and abundant granular eosinophilic cytoplasm, from which this tumor derives its name. The variation is caused by granular cytoplasmic accumulation of lysosomes. Nuclei are small, centrally located and hyperchromatic with one or two nucleoli. They are not displayed mitosis, pleomorphism, multiplicity or nuclear atypia [1,2,4,7]. Multi nucleation and rare mitotic features can be seen, but these features should not be interpreted as evidence of malignancy. Variable amounts of stroma collagen are present. Histochemical analysis confirms if the granules are diastase resistant and periodic acid Schiff positive [1,6]. The definitive diagnosis of GCT is only possible with the examination immunohistochemistry and therefore it is always necessary to tissue samples for a correct diagnosis. The tumor cells are strongly immunoreactive for S-100 protein. They do not show staining for cytokeratins, epithelial membrane antigen or mucin. The cells were reported positive for CD68, carcinoembryonic antigen and vimentin in some cases in the literature [1,3]. In our cases, the description of the pathological features was supported by immunohistochemistry: S-100 protein-positive and negative cytokeratin. While most of the TCG behave in a benign, malignant occasional cases have been described (less than 1% of all GCT, including breast lesions, are malignant) [4,6,7]. The distinction between benign and malignant GCT was proposed by Le et al. [11] and Adeniran et al. [7], and including the criteria of necrosis, spindling, vesicular nuclei with large nucleoli, increased mitotic activity (more than two mitoses per 10 high power field at  $\times 200$  magnification), high nuclear cytoplasmic ratio, and nuclear pleomorphism. These criteria classify GCT by histology in atypical (when two of these six criteria are present) and malignant (when three or more of these six criteria are met) [4]. GCTs should be distinguished from breast cancer, particularly scirrhous carcinoma and apocrine. The difference between GCT and granulomatous inflammatory reaction or a histiocytic tumor is negative for antigens histiocytes-associated,

although reactivity to CD68 has been described in a GCT [12]. GCT should be distinguished from metastatic breast cancer who have characteristics of cells oncocyctic or clear, as renal cell carcinoma, malignant melanoma and sarcoma, alveolar soft part [1,6]. Wide local excision with clear margins is the treatment of choice [13,14]. Subtotal excision may lead to local recurrence. Direct invasion of an axillary lymph node from a GCT breast that arose in the axillary tail was reported [1,3,6].

### 3. Conclusion

The reported cases show that although GCT of the breast is a relatively rare breast neoplasm, should always be considered in the differential diagnosis of benign and malignant lesions. The surgeon should always be aware that a cytological diagnosis is not always correct, and that, in the case of resection, this should be as large as possible in order to avoid local recurrences. The pathologist, however, should keep in mind when considering GCT cells containing materials with abundant granular cytoplasm to avoid misdiagnosing breast cancer, which could lead to unnecessary surgery.

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### Ethical approval

Not required.

### Author contribution

Alessandro Sanguinetti, Nicola Avenia: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data; also the drafting and editing of the manuscript.

Andrea Polistena, Roberta Lucchini, Massimo Monacelli, Sergio Galasse, Stefano Avenia, Roberta Triola, Walter Bugiantella, Fabio Rondelli, Roberto Cirocchi: Participated substantially in conception, design, and execution of the study and in the analysis and interpretation of data.

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