Myoblastoma of the breast: Our experience and review of literature

A. Sanguinetti a,⁎, A. Polistena b, R. Lucchini a, M. Monacelli c, S. Galasse b, S. Avenia d, W. Bugiantella b, R. Triola a, R. Cirocchi b, F. Rondelli b, N. Avenia b

a S. Maria University Hospital, Terni, Italy
b University of Perugia, Italy
c Perugia University Hospital, Italy
d Medical School University of Perugia, Italy

ABSTRACT

INTRODUCTION: Breast myoblastoma or granular cell tumor involving the breast parenchyma has been described in detail for the first time since Abrikossoff 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 a mass inside the 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 the two cases 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 this 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 tumors 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 then fully described by Abrikossof 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. Abrikossof 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, it 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 radiological, 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 17mm, located at
the Union of external quadrants of the left breast, to the serra-
tus 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 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 cycli-
cal pain. Mammography and ultrasound revealed a mass within
a 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 sur-
rounding 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 gran-
ules. 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
anatomical organ of origin is the most common language, fol-
lowed 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. Sev-
eral 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 soli-
dary, 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 prefer-
ence 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 qua-
rant, 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 Abrikossoff
first described the type of tumor is assumed to originate in skeletal
muscle [2]. Chung and Work have suggested an origin smooth mus-
cle [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, immunohis-
itochemical profiling suggests that it is unlikely to be of muscle
due to the negativity for alpha-smooth muscle actin) or epithel-
ial (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 centime-
ters 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 tis-
sue, adipose tissue and the muscle serratus. These features mimic
malignant growth patterns and give the impression of infiltrating
carcinoma variant scirrrosa [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 sam-
pling 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, pleomor-
phism, 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 gran-
ules 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 tis-
sue 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 immuno-
histochemistry: 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, vesicu-
lar nuclei with large nucleoli, increased mitotic activity (more than
two mitoses per 10 high power field at >200 magnification), high
nuclear cytoplasmic ratio, and nuclear pleomorphism. These cri-
teria 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 differ-
ence 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 oncocytic 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 that arose in the axillary tail was reported [1,3,8].

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.

Conflicts of interest

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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.

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