Intraparenchymal Breast Leiomyoma and Atypical Leiomyoma

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Case Report

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Abstract

Introduction:

Intraparenchymal breast leiomyoma is a rare lesion of breast. The diagnostic criteria to differentiate benign and borderline breast leiomyoma was not yet clear. No atypical leiomyoma of breast parenchyma has been reported.

Case series presentation:

We described one case of leiomyoma and one case of bilateral atypical leiomyoma in breast parenchyma. The morphological features that lead to the diagnosis of atypical leiomyoma include invasive growth pattern, mild nuclear atypia and mitotic figures up to 3mitoses/10HPF.

Conclusion

Due to the limited experience, cases presented as atypical intraparenchymal breast leiomyoma should be closely followed.

Introduction

Intraparenchymal breast leiomyoma is a rare lesion of breast. Compared to leiomyoma of breast skin and of the nipple/areola, intraparenchymal breast leiomyoma is often larger[1]. Breast leiomyoma share the same histology and immunophenotype with leiomyoma of other site[2]. In uterine, leiomyoma can be classified into benign, borderline and malignant and different subtypes have distinct histologic morphology and clinical behavior[3, 4]. However, due to the rarity of this lesion, the diagnostic criteria along with the correlation between histologic morphology and biological behavior is still not clear[5, 6]. No reports have been previously published documenting atypical leiomyoma of breast. We report one case of benign leiomyoma and one case of atypical leiomyoma in breast parenchyma.

Case Report

Case 1

A 46-year-old woman presented with a lump of 3cm in left breast for 10 days in March 2019. Lumpectomy was performed with all margins clean. Histological examination revealed a well-circumscribed lesion in breast parenchyma composed of uniform spindle tumor cells with abundant eosinophilic cytoplasm. No nuclear atypia, necrosis or mitotic figures was found. Under high magnification, blunt-ended nuclei morphology can be noticed. (Fig. 1). SMA, desmin and caldesmon stain were positive in immunohistochemistry and a diagnosis of intraparenchymal breast leiomyoma was

made. Its Ki-67 proliferative index was lower than 1% The patient experienced no recurrence until last follow-up in July 2021.

Case 2

A 43-year-old woman presented with bilateral breast lumps for 6 months in Sep 2012. Ultrasound revealed right mass as 1cm and left mass as 3cm. She has a medical history of bilateral breast mass in 2010 which was treated by lumpectomy and post-surgery pathological examination the diagnosis of spindle cell tumor without further classification.

Bilateral lumpectomy was performed with all margins clean. Histopathological morphology of tumor in left breast has some characteristics that are different from conventional leiomyomas, including invasive growth pattern (packing many normal glands and ducts in the tumor), scattered mild nuclear atypia, and mitotic figures (up to 3/10 HPF). Those features have exceeded the criteria for leiomyoma, but fall below the threshold of leiomyosarcoma. A diagnosis of atypical leiomyoma of the breast was made. Histologic morphology of tumor in right breast is very similar to the tumor at contralateral except that the invasive growth pattern is less obvious. Immunohistochemistry stain has shown a positive stain in SMA and desmin and a Ki-67 positive percentage of 5%. (Fig. 2). The patient experienced no recurrence until last follow-up in July 2021.

Conclusion

We described one case of leiomyoma and one case of atypical leiomyoma in breast parenchyma. Smooth muscle tumors of the breast are relatively rare, and the diagnostic criteria are not yet elucidated. The biological behavior and recurrence rate of morphologically borderline leiomyoma or atypical leiomyoma is not particularly clear. In our reported case of atypical leiomyoma, the patient experienced no recurrence after lumpectomy while her medical history of spindle cell tumor in bilateral breast highly suggest that the atypical leiomyoma recurred from previous lesions.

Smooth muscle tumor of uterine is common and the histologically borderline leiomyoma has been classified using an entity of "smooth muscle tumor of uncertain malignant potential" (STUMP) by World Health Organization (WHO)[7–11]. STUMPs of uterine has well-defined diagnostic criteria including focal/multifocal or diffuse nuclear atypia and 6–9 mitoses/10HPF; more than 15 mitoses/10HPF without cytological atypia or necrosis; tumor with diffuse nuclear atypia and uncertain mitoses which is often due to brisk karyorrhexis. The recurrence rate of STUMPs in uterine was reported to be lower than 2% [4].

Leiomyosarcoma of the breast share similar morphology and diagnostic criteria with those in other parts of the body, including irregular infiltrative borders, prominent nuclear atypia, pleomorphism and mitotic activity[12–14]. In the condition of multiple or recurrent breast leiomyoma, the condition of hereditary leiomyomatosis and renal cell cancer should be considered which was caused by germline mutation in fumarate hydratase (FH) gene [15], although in our reported case patients reported no such family history.

Breast leiomyoma belongs to breast spindle cell tumors and its differential diagnosis include fibroblastic and myofibroblastic tumor, spindle cell lipoma, nodular fasciitis and nerve sheath tumor[16]. Usually, positive stain of SMA and desmin by IHC could confirm a smooth muscle origin. The cell origin of breast parenchymal leiomyoma was not clear yet and several hypotheses exist including through smooth muscle metaplasia of myoepithelial cell, through smooth muscle cells surrounding blood vessel and through differentiation from multipotent mesenchymal cells[17].

Declarations

The authors declare no competing interest.

Consent

Written informed consent was obtained from patients for publication of this case report and any accompanying images.

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Figures

Figure 1

Benign intraparenchymal breast leiomyoma. A) ,B) and C) Histologic image of leiomyoma in case 1 (H&E $\times 10$, $\times 100$ and $\times 400$).

Figure 2

Bilateral atypical leiomyoma of breast. A) Leiomyoma of left breast. Noted the invasive growth pattern of this tumor including its infiltrative margin and the packed normal mammary glands in it. The infiltrative margin indicated by the black square is magnified in B (H&E, $\times 10$). B) Noted the infiltration of this tumor into adipose tissue (H&E, $\times 200$). C) Nuclei of tumor cells in high magnificant view showed typical spindle

morphology with blunt end which is characteristics for leiomyoma (H&E, $\times 400$). D) and E) Immunohistochemical stain of SMA and Ki-67 in A). F) Leiomyoma of right breast (H&E, $\times 10$).