A Case of Inflammatory Pseudotumor of the Breast after Augmentation Mammoplasty

Kazuo Ishizuna¹, Jun Ninomiya², Makoto Kojima¹, Miho Kawashima³, Fumiko Nishibayashi³, Miwako Nozaki¹, Hidetsugu Yamagishi¹, Yoshihiko Ueda⁴, Masatoshi Oya¹

¹Breast Center, Dokkyo Medical University Koshigaya Hospital,
²Ninomiya Hospital,
³Department of Radiology, Dokkyo Medical University Koshigaya Hospital,
⁴Department of Pathology, Dokkyo Medical University Koshigaya Hospital,

SUMMARY

Inflammatory pseudotumor is a benign reactive lesion which forms due to diverse tissue responses of inflammatory cells and mesenchymal cells. It can occur in various organs of the body but rarely in the breast. We report a case of inflammatory pseudotumor of the breast after augmentation mammoplasty.

The patient was a 78-year-old woman who noticed a mass in her right breast in July 2012. She had a history of augmentation mammoplasty at age 24 years. She was referred to our hospital for thorough examination. A 3-cm immovable induration was palpated in the upper lesion of the right breast. Ultrasound examination revealed a hypoechoic mass at the same site. The mass was 2.9×1.7 cm with irregular, ill-defined borders. Mammography revealed some areas of elevated density with coarse, lucent-centered calcifications in bilateral breasts but no clear findings of malignancy. Core needle biopsy of this site revealed marked fibrous hyperplasia and proliferation of fibroblast-like spindle cells. Infiltration of neutrophils and plasma cells was observed in the stroma. There were spindle cells with no atypia and scarce mitotic figures. Thus, the patient was diagnosed with inflammatory pseudotumor. The patient received only follow-up observation without surgical resection as per the patient’s wishes. There has not been any change as of May 2013.

Key Words: Inflammatory pseudotumor, Breast

INTRODUCTION

Inflammatory pseudotumor is a benign reactive lesion that forms due to diverse tissue responses of inflammatory cells and mesenchymal cells. It can occur in various organs of the body¹ ² but a primary inflammatory pseudotumor of the breast is rare. It needs to be clinically differentiated from malignant tumors. We report here a case of an inflammatory pseudotumor of the breast after augmentation mammoplasty.

CASE REPORT

The patient was a 78-year-old woman who noticed a mass in her right breast in July 2012 and was referred to our hospital. She had a history of augmentation mammoplasty (details unknown) at age 24 years. A 3-cm immovable induration was palpated in the upper lesion of the right breast. Ultrasound examination revealed a hypoechoic mass at the same site. The mass was 2.9×1.7 cm with irregular, ill-defined borders and
Kazuo Ishizuna

munostaining was negative (results not shown). The patient received only follow-up observation without surgical resection as per the patient’s wishes. There has not been any change as of May 2013.

Inflammatory pseudotumor is a benign nodular lesion with tumor-like clinical presentation. However, its histological features include non-specific inflammation and mesenchymal repair. There is proliferation of spindle cells with the characteristics mainly of myofibroblasts or fibroblasts. Marked infiltration of inflammatory cells is also seen including of lymphocytes and

posterior echo attenuation (Breast Imaging Reporting and Data System (BI-RADS) category 4b (intermediate suspicion for malignancy)) (Fig. 1). Mammography revealed some areas of elevated density with coarse, lucent–centered calcifications in bilateral breasts but no clear findings of malignancy (Fig. 2). Histopathological findings of core needle biopsy showed marked fibrous hyperplasia and proliferation of fibroblast–like spindle cells. Infiltration of neutrophils and plasma cells was observed in the stroma. There were spindle cells with no atypia and scarce mitotic figures. Thus, the patient was diagnosed with inflammatory pseudotumor (Figs. 3A and B). IgG4 immunostaining was negative (results not shown). The patient received only follow-up observation without surgical resection as per the patient’s wishes. There has not been any change as of May 2013.

**DISCUSSION**

Inflammatory pseudotumor is a benign nodular lesion with tumor-like clinical presentation. However, its histological features include non-specific inflammation and mesenchymal repair. There is proliferation of spindle cells with the characteristics mainly of myofibroblasts or fibroblasts. Marked infiltration of inflammatory cells is also seen including of lymphocytes and
<table>
<thead>
<tr>
<th>Case</th>
<th>Author(s)</th>
<th>Year of publication</th>
<th>Age</th>
<th>Sex</th>
<th>Medical history</th>
<th>Circumstance of discovery</th>
<th>Size (cm)</th>
<th>Preoperative diagnosis</th>
<th>Surgical resection or follow-up alone</th>
<th>Recurrence/follow-up period</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vecchio GM</td>
<td>2011</td>
<td>22</td>
<td>M</td>
<td>Injury</td>
<td>Self-discovered breast mass</td>
<td>7</td>
<td>No</td>
<td>Resection</td>
<td>No/10 mo.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sari A</td>
<td>2011</td>
<td>54</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>2.7</td>
<td>No</td>
<td>Resection</td>
<td>No/4 mo.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hill PA</td>
<td>2010</td>
<td>53</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>3.5</td>
<td>No</td>
<td>Resection</td>
<td>Unknown</td>
<td>IgG4+</td>
</tr>
<tr>
<td>4</td>
<td>Kim SJ</td>
<td>2009</td>
<td>60</td>
<td>F</td>
<td>Non-contributory</td>
<td>By MMG exam</td>
<td>1.5</td>
<td>Yes (using MMT)</td>
<td>Resection</td>
<td>No/2 yr</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Park SB</td>
<td>2009</td>
<td>47</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>3.5</td>
<td>Yes (using CNB)</td>
<td>Resection</td>
<td>No/3 yr</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Akbulut M</td>
<td>2007</td>
<td>38</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>1</td>
<td>No</td>
<td>Resection</td>
<td>No/1 yr</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Khanafshar E</td>
<td>2005</td>
<td>33</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>2</td>
<td>Unknown</td>
<td>Resection</td>
<td>Yes/after 3 mo</td>
<td>No/7 mo</td>
</tr>
<tr>
<td>8</td>
<td>Zen Y</td>
<td>2005</td>
<td>46</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>2.1</td>
<td>Unknown</td>
<td>Resection</td>
<td>No/12 mo</td>
<td>High serum IgG4</td>
</tr>
<tr>
<td>9</td>
<td>Ilvan S</td>
<td>2005</td>
<td>60</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>1</td>
<td>No</td>
<td>Resection</td>
<td>No/85 mo</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Zardawi IM</td>
<td>2003</td>
<td>79</td>
<td>F</td>
<td>Non-contributory</td>
<td>By MMG exam</td>
<td>&lt;1.5</td>
<td>No</td>
<td>Resection</td>
<td>Yes/after 9 yr</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Haj M</td>
<td>2003</td>
<td>31</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>6</td>
<td>Yes (using CNB)</td>
<td>Resection</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Sastre-Garau X</td>
<td>2002</td>
<td>64</td>
<td>F</td>
<td>Non-contributory</td>
<td>By MMG exam</td>
<td>3</td>
<td>No</td>
<td>Resection</td>
<td>No/33 mo</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Gobbi H</td>
<td>1999</td>
<td>86</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>1.5</td>
<td>No</td>
<td>Resection</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Yip CH</td>
<td>1997</td>
<td>66</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>3</td>
<td>No</td>
<td>Resection</td>
<td>Yes/after 5 mo</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Chetty R</td>
<td>1997</td>
<td>16</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>2</td>
<td>Unknown</td>
<td>Resection</td>
<td>No/12 mo</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Bisceglia M</td>
<td>1995</td>
<td>38</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>2</td>
<td>Unknown</td>
<td>Resection</td>
<td>No/12 mo</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Coffin CM</td>
<td>1995</td>
<td>13</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>4</td>
<td>Unknown</td>
<td>Resection</td>
<td>No/12 mo</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Pettinato G</td>
<td>1988</td>
<td>29</td>
<td>F</td>
<td>Non-contributory</td>
<td>Self-discovered breast mass</td>
<td>4.5</td>
<td>No</td>
<td>Resection</td>
<td>No/30 mo</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Ishizuna K (this case report)</td>
<td>2013</td>
<td>78</td>
<td>F</td>
<td>Previous augmentation mammoplasty</td>
<td>Self-discovered breast mass</td>
<td>2.9</td>
<td>Yes (using CNB)</td>
<td>Follow-up</td>
<td>No change/6 mo</td>
<td></td>
</tr>
</tbody>
</table>
plasma cells\(^1,2\). Inflammatory pseudotumor can occur in any part in the body but it most commonly involves the lung, liver, orbit, gastrointestinal tract, and soft tissues. It rarely occurs in the breast, and there have been only 19 articles (23 cases) of English-language reports since Pettinato reported the first case in 1988 (Pubmed search by keywords “inflammatory pseudotumor” and “breast”) (Table 1).\(^3\)\textsuperscript{1}\textsuperscript{3}\textsuperscript{2}\textsuperscript{5}\textsuperscript{6}\textsuperscript{7}\textsuperscript{8}

The mean age was 47.8 years (range 13–86 years) for 23 cases, including the patient in our report. These patients consisted of 1 man and 22 women. Three patients had a history of injury or surgery. Five patients had a breast mass discovered by mammography or MRI, and seventeen patients had a self-discovered breast mass. All patients had a solitary mass and the mean size was 3.0 cm (range: 1–8 cm). Cytological examination was performed in 6 patients\(^7,9,12,13,16,20\) but a definitive diagnosis could not be made. Needle biopsy or mammotome biopsy was performed in five patients\(^3\textsuperscript{5}1\textsuperscript{6}1\textsuperscript{7}\textsuperscript{9}\textsuperscript{10}\textsuperscript{13}\textsuperscript{16}\textsuperscript{20}\), of whom four were diagnosed with inflammatory pseudotumor. Except in our patient, determination of malignancy could not be made based on imaging findings, and the mass was surgically resected. Three of twenty-one patients with surgical resection had recurrence in the breast.

There are only a small number of imaging reports on inflammatory pseudotumor of the breast. It is depicted in mammographic images as a high-density mass with ill-defined borders in many cases\(^3\textsuperscript{4}8\). One case had spicules\(^9\). In many cases, inflammatory pseudotumor is depicted in mammary ultrasound images as a hypoechoic mass with irregular, ill-defined borders\(^4,6,8\). One case with echogenic halo has been reported\(^4\). Thus, there are cases in which differentiation is difficult between inflammatory pseudotumor of the breast and breast cancer based on imaging, and most reported cases had undergone surgical resection for diagnosis and treatment.

Some studies have suggested that inflammatory pseudotumors are associated with infection, injury\(^21\), local ischemic changes due to thromboembolism\(^22\), EB virus\(^23,24\), and IgG4-related disease\(^12,14\). However, there has not been a consensus on the cause of inflammatory pseudotumor. Lymphovascular invasion, local recurrence\(^7,9,10\), or distant metastasis\(^25\) can sometimes occur. Abnormalities of chromosome 2p23 and ALK-1 protein expression are observed in some cases. Thus, there has been a recent proposal to classify inflammatory pseudotumor as a true neoplasm\(^26,27\).

The patient in our report had an inflammatory pseudotumor of the breast after augmentation mammoplasty. Ultrasound findings raised suspicion of breast cancer, and core needle biopsy was performed which revealed an inflammatory pseudotumor. The pathogenesis of inflammatory pseudotumor has not yet been elucidated, and more cases need to be accumulated. Inflammatory pseudotumors have malignant potential as mentioned previously. Normally, surgical resection should be considered, but the patient in our report was an elderly person and did not wish to undergo surgery. Thus, she received only follow-up observation without surgery, and no changes have been observed.

CONCLUSION

We reported a case of inflammatory pseudotumor that occurred after augmentation mammoplasty. There are only a small number of reported cases of inflammatory pseudotumor of the breast. It will be necessary to accumulate more cases to elucidate its pathogenesis.

REFERENCES

7) Yip CH, Wong KT, Samuel D: Bilateral plasma cell granuloma (inflammatory pseudotumour) of the
A Case of Inflammatory Pseudotumor of the Breast

1) 153