

Mammographic and Ultrasonographic Findings after Thread-Embedding Procedure for Breast Augmentation: Case Report

So Yoon Park¹, Boo-Kyung Han², Eun Young Ko², Eun Sook Ko², Ji Soo Choi²

Department of ¹Radiology and ²Center for Imaging Science, Samsung Medical Center, Sungkyunkwan University School of Medicine

A thread-embedding procedure in breast has been used for breast augmentation in oriental medicine by inserting absorbable suture materials within the subcutaneous fat and muscle of anterior chest wall (1, 2). A few clinical cases were reported in oriental medicine journal in early 2000s. We report 3 cases of foreign body granulomas after the thread-embedding breast augmentation, which were seen on mammography and ultrasound, mimicked a malignancy. They were usually located in subcutaneous fat layer of bilateral axillary tail and inner most breasts, and in the pectoralis major muscle and interpectoral space.

Index words: Foreign body granulomas; Thread-embedding; Breast augmentation; Oriental medicine; Mae-sun

Thread-embedding procedure is used in oriental medicine for breast augmentation in the oriental medicine. It is also called as ‘mae-sun therapy’, ‘catgut embedding therapy’ and ‘thread implantation therapy’ (3). Oriental clinics insert multiple threads composed of polydioxanone which is one of the absorbable suture materials. The first generation of this procedure used chromic catgut which is avoided due to large inflammatory and foreign body

reactions (4). The thread-embedding procedure for breast augmentation was started in early 2000s and several oriental medicine journals were published (1-3), but no radiologic report was published until now. We report 3 cases of foreign body granulomas after thread-embedding breast augmentation.

Case Reports

Case 1

A 58-year-old female visited our institution for screening-detected abnormality. Mammography showed ill-defined isodense nodular densities in right breast axillary tail (Fig. 1a). Breast ultrasonography (US) showed several lobulated

Correspondence to: Boo-Kyung Han, M.D.
Department of Radiology and Center for Imaging Science, Samsung Medical Center, Sungkyunkwan University School of Medicine, 50, Ilwon-dong, Gangnam-gu, Seoul 135-710, Korea
Tel: 82-2-3410-2518, Fax: 82-2-3410-2559
e-mail: bkhan@skku.edu

hypoechoic nodules within the right pectoralis muscle and in the interpectoral space. Mildly increased peripheral vascularity was noted. Core needle biopsy was done and pathologic result was foreign body granuloma. Six-month follow-up mammography showed other nodular densities in left upper peripheral breast. Breast US showed similar shaped hypoechoic masses, which were seen within and anterior to left upper pectoralis major muscle (Fig. 1b). US showed hyperechoic dot like lesions within the mass but no calcifications were seen in the mammography. She had a history of thread-embedding breast augmentation at oriental medical clinic 1 year before the first lesion detected. Left lesions were considered as the same spectrum to the right side and core needle biopsy was not performed.

Case 2

A 49-year-old female who complained of palpable breast lumps in bilateral breasts underwent mammography and breast US. Mammography

showed multiple circumscribed isodense nodular densities in both breast axillary tails, located in the subcutaneous fat layer. Some nodules contained amorphous, heterogeneous calcifications (Fig. 2a). Breast US showed multiple circumscribed, oval or round, hypoechoic nodules in bilateral breast axillary tails, mainly located in the subcutaneous fat layer. The lesions showed thick echogenic rims and internal hyperechoic dots with mildly increased peripheral vascularity (Fig. 2b). The size and number of the lesions were slowly increased when we reviewed previous mammographic images. Core needle biopsy was done and the pathologic result was foreign body granuloma. She had also a history of thread-embedding breast augmentation at oriental medical clinic 10 years ago.

Case 3

A 54-year-old female complained of palpable breast lumps and pain in the right breast. She had history of thread-embedding breast augmentation at oriental medical clinic. Compared to previous

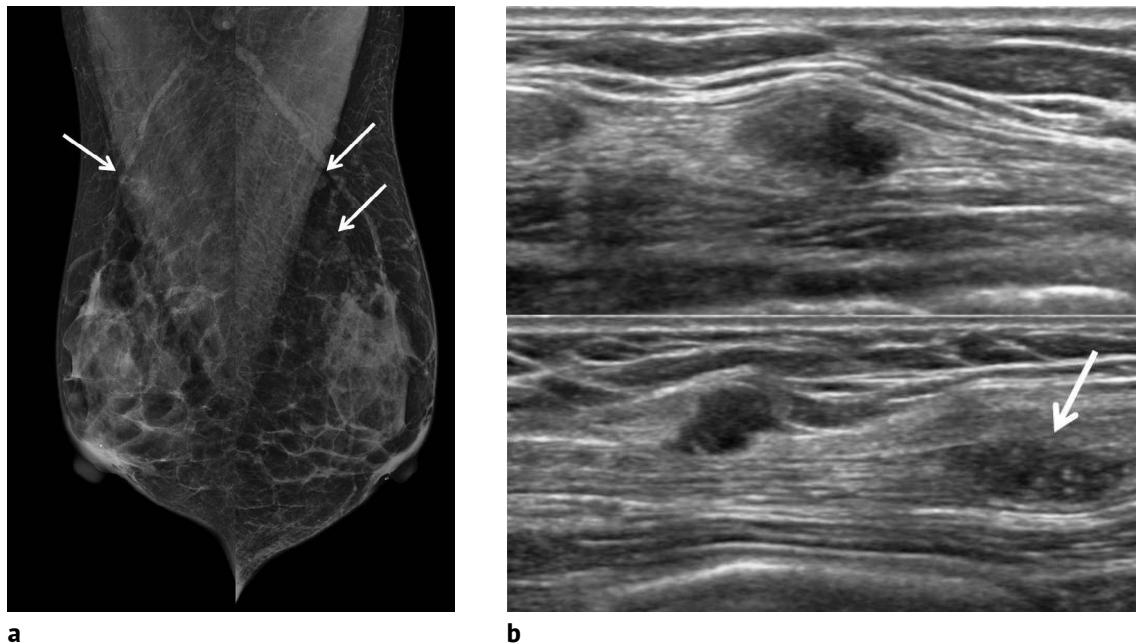


Fig. 1. A 58-years-old female with screening-detected abnormality.

(a) Both MLO views show ill-defined isodense nodular densities in axillary tail areas of both breasts (arrows). (b) Breast US show several lobulated hypoechoic nodular lesions in the right interpectoral space (upper row) and within the left pectoralis muscle (lower row). There are hyperechoic dot-like lesions within the mass (arrow).

mammography which was taken 3 years ago, iso and hyper-dense circumscribed nodules were newly seen, which were located in the subcutaneous fat layer of bilateral breast axillary tails and inner most breasts (Fig. 3a). US showed irregular-shaped hypoechoic nodules within the subcutaneous fat layer of bilateral axillary tails and parasternal area (Fig. 3b). Increased peripheral vascularity and internal echogenic dot-like lesions were seen but there was no mammography-detected calcification within the nodules. Core needle biopsy was not performed because we thought the lesions were typical foreign body granulomas cause by thread-embedding breast augmentation, considering the

location and history.

Discussion

Thread-embedding breast augmentation is oriental medicine-based procedure which inserts multiple absorbable suture materials within the subcutaneous fat and muscle of anterior chest wall (1, 2). Many journals reported foreign body reactions and inflammatory capsule formation around the absorbable suture materials, especially in chronic catgut which was used for thread-embedding procedure in first generation [5-7]. Although polydioxanone, material used for thread-

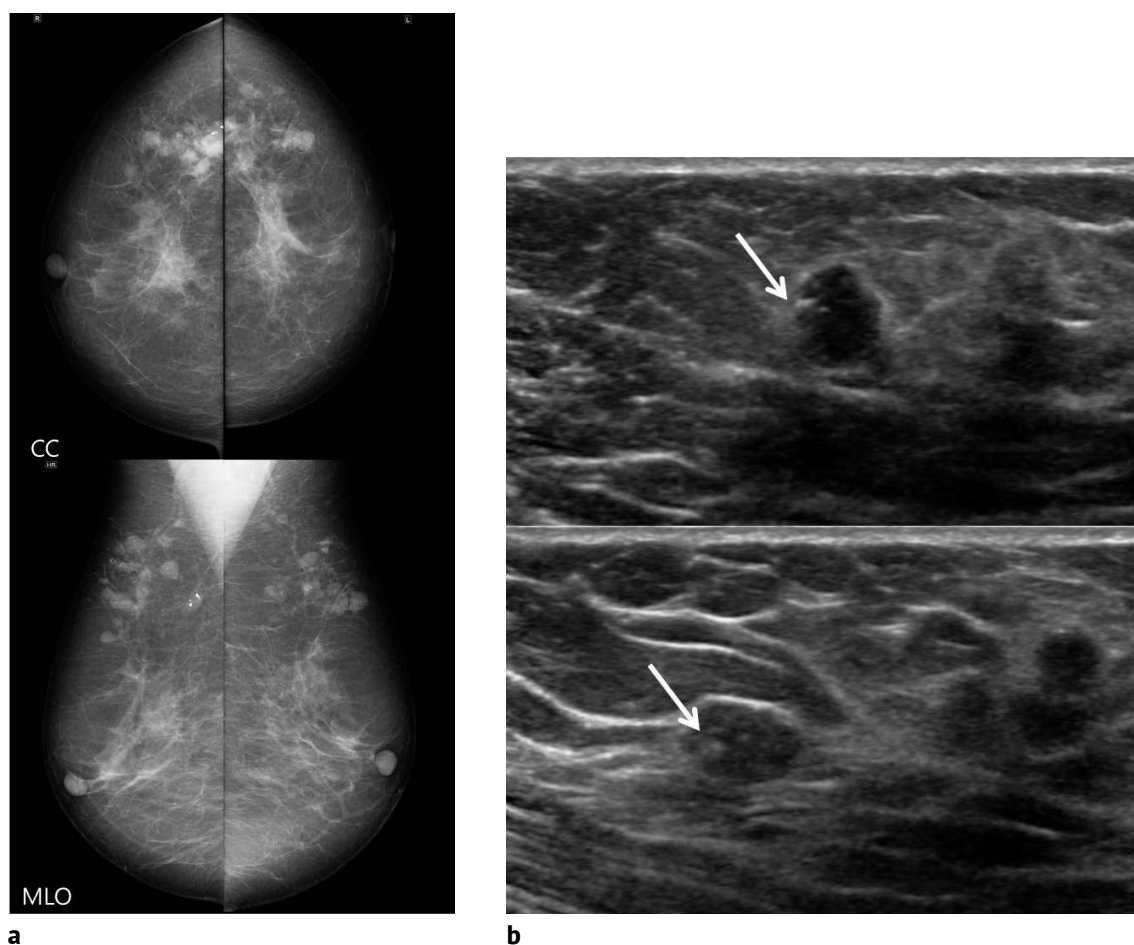


Fig. 2. A 49 years of female who complained palpable breast lump in bilateral breast.
(a) Mammography images show multiple isodense circumscribed nodular densities in both breast axillary tails, mainly located in the subcutaneous fat layer. Some nodules contain amorphous, heterogeneous calcifications. **(b)** Breast US show multiple circumscribe oval or round shape hypoechoic nodules in the subcutaneous fat layer of bilateral breast axillary tails. The lesions show thick echogenic rim and internal hyperechoic dot-like lesions (arrows).

embedding in now days, show less inflammatory reaction but mild tissue reaction was also reported (5). Using thread-embedding procedure for breast

augmentation is more concerned because of the risk of obscuring breast cancers. The amount of the thread used for breast augmentation is large;

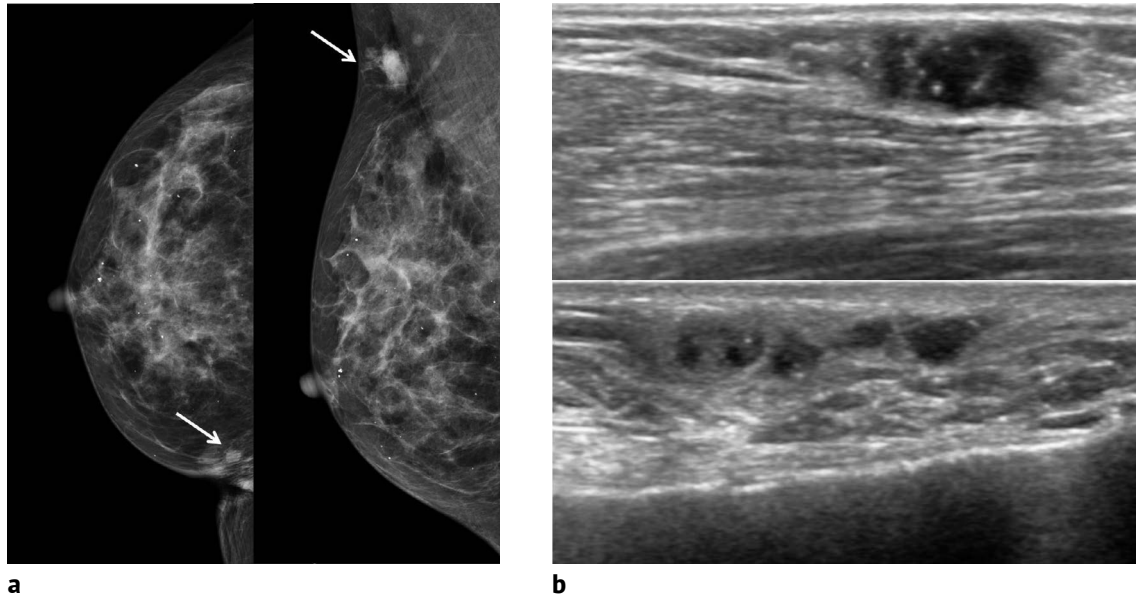


Fig. 3. A 54 years of female complained palpable breast lump and pain in the right breast.

(a) Right mammography shows ill-defined, iso and hyperdense nodules which are located in the subcutaneous fat layer of bilateral breast axillary tails and inner most breasts (arrows) (Left breast is not shown here). (b) US show irregular-shaped hypoechoic nodules within the subcutaneous fat layer of bilateral axillary tails and parasternal areas with internal nodular echogenic dot-like lesions.

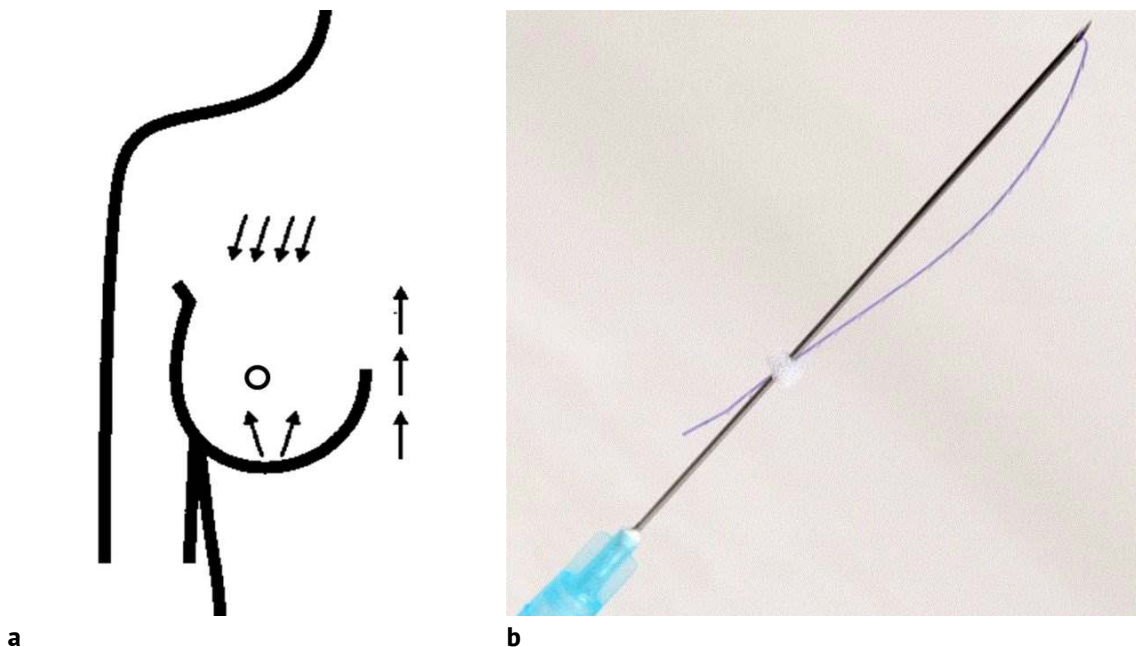


Fig. 4. (a) The location of thread insertion (arrows) in thread-embedding breast augmentation. (b) The picture of thread-embedding instrument.

the procedure inserted 10 of 5 cm threads at one time and total 10 procedures were done by 2 week interval for one patient. The large amount of foreign bodies might be one of the reasons for the granuloma formation.

The notable characteristic mammographic and US finding of foreign body granulation caused by thread-embedding breast augmentation was distribution and location. All three cases showed bilateral lesions located around bilateral axillary tails, in the subcutaneous fat layer, interpectoral space and within the pectoralis muscle. One case showed additional lesions located in the subcutaneous fat layer of inner most breasts. This typical location is explained by technique of thread-embedding procedure for breast augmentation, illustrated in Fig. 4a. They say they try to insert threads in upper and lower chest wall targeting the pectoralis major muscle by palpation, and be cautious not to insert the thread into the breast tissue itself (1, 2). Therefore, most abnormal findings were located in peri-mammary areas. This is differential point from foreign body reactions from the autologous fat injection which is usually located in mammary areas (8).

Mammography showed iso- or hyper-dense nodular densities in typical locations and one of three cases showed amorphous, heterogeneous calcifications within the nodules. US showed hypoechoic lobulated, oval or round shape nodules located in the subcutaneous fat layer, interpectoral space and within the pectoralis major muscle. All three cases showed increased peripheral vascularity which might represent inflammatory reaction. In 2 of 3 cases, US showed hyperechoic dot-like lesions within the nodules but mammographic calcifications were not evident. And also, calcifications were not detected in core needle biopsy specimens. The hyperechoic dots of US might be residual non-degraded thread materials. There were several radiologic reports of US findings of granuloma caused by suture materials (9, 10). The US findings

of suture granulomas were well-defined hypoechoic or irregular-shaped hypo to isoechoic nodules with peripheral increased vascularity which were similar to that of our cases (9, 10). And importantly, internal hyperechoic foci were the characteristic findings of suture granulomas, which represented non-degraded suture materials (9, 10). Although these reports were based on suture granulomas caused by non-absorbable suture materials, but one animal test report about local tissue reactions to biodegradable suture materials showed the case of large deformed unlyzed fragments of threads with perifocal productive inflammation, cicatricial transformation of connective tissue after 12 months of absorbable suture material implantation (6). We thought our cases have similar US findings of previous reports.

The duration of granuloma formation after thread-embedding procedure was variable (1-10 years). Foreign body granulomas caused by thread-embedding procedure showed slowly growing in number and size which was similar to previous reports of suture granulomas (9).

In summary, when we see nodules with slowly growing in size and number, located in the subcutaneous fat layer or inter or peri-pectoral area, distributing bilaterally in axillary tails or inner most breasts, we should consider the possibility of foreign body granulomas caused by thread-embedding breast augmentation. Careful history taking is integral and it is important for radiologists to differentiate it from breast cancers.

References

1. Kim Yong-keol, H.J.-w., Park Tae-yong and Oh Min-seok, 3040대 기혼 여성을 대상으로 한 자홍침의 유방 확대효과에 대한 임상연구. The Journal of Korean Acupuncture & Moxibustion Society 2010;27:75-82
2. Han Joo-won, K.S.-j.a.O.M.-s., 20대 여성을 대상으로 한 자홍침의 유방 확대효과에 대한 임상연구. The Journal of Korean Acupuncture & Moxibustion Society 2008;25:117-123

3. Kwon, K. The Analysis on the Present Condition of Thread-embedding Therapy Papers Published in Journal of Korean Medicine. The Journal of Korean Medicine Ophthalmology and Otolaryngology and Dermatology 2014;27:16-44
4. Andrade, M.G., R. Weissman, and S.R. Reis, Tissue reaction and surface morphology of absorbable sutures after in vivo exposure. J Mater Sci Mater Med 2006;17: 949-961
5. Kontio, R., et al., Biodegradable polydioxanone and poly(l/d)lactide implants: an experimental study on peri-implant tissue response. Int J Oral Maxillofac Surg 2005;34:766-776
6. Kuznetsova, I.V., et al., Local tissue reaction to implantation of biodegradable suture materials. Bull Exp Biol Med 2014;157:390-394
7. Chuang, Y.T., et al., An unusual complication related to acupuncture point catgut embedding treatment of obesity. Acupunct Med 2011;29:307-308
8. Veber, M., et al., Radiographic findings after breast augmentation by autologous fat transfer. Plast Reconstr Surg 2011;127:1289-1299
9. Kim, J.H., et al., Ultrasound features of suture granulomas in the thyroid bed after thyroidectomy for papillary thyroid carcinoma with an emphasis on their differentiation from locally recurrent thyroid carcinomas. Ultrasound Med Biol 2009;35:1452-1457
10. Rettenbacher, T., et al., Suture granulomas: sonography enables a correct preoperative diagnosis. Ultrasound Med Biol 2001;27:343-350

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유방 확대를 위한 매선 요법 후 유방촬영과 초음파 소견: 증례 보고

박소윤¹ · 한부경² · 고은영² · 고은숙² · 최지수²

성균관대학교 의과대학 삼성서울병원 영상의학과¹, 영상의학연구소²

유방확대를 위한 매선요법은 한의학에서 흉벽의 피하지방과 근육층에 피흡수성 봉합사 물질을 주입함으로써 이루어지고 있다 (1, 2). 유방확대를 위한 매선요법은 2000년대 초반부터 시행되었다. 저자들은 유방확대를 위한 매선 요법 후 생긴 변화의 유방촬영과 유방초음파 소견에 대한 세 가지 증례를 보고하는 바이다. 병변들은 주로 양측 유방 겨드랑이 쪽과 가장 안쪽의 피하지방층, 대흉근 내와 흉근 간 공간에 위치하고 있었다.

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Corresponding author: Boo-Kyung Han, M.D.