

## Peer Review File

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### **Responds to the reviewer's comments:**

#### ***Reviewer A***

**Comment 1:** The authors report on the IMF after MRI scanning in Chinese women with a mean age of 41 years. The IMF is thicker laterally and not uncommonly asymmetrical. The IMF was located at different rib positions-but this has not been correlated with patient age or pregnancies.

**Reply 1:** Thank you for your approval and professional comments.

**Changes in the text:** None.

**Comment 2:** The authors report " ...the thickness of IMF can provide guidance for breast reduction, as the 12 reconstructed IMF should be thinned to a normal IMF thickness." There is no reference for this statement and this is not conventional treatment.

**Reply 2:** Thank you for your professional comment. We apologize for the missing reference to IMF revision in breast reduction. Generally, patients with macromastia tend to have a low inframammary fold. Thus, one key principle of breast reduction was to remove the fat to elevate the bottomed-out inframammary fold. Following your suggestion, we have added a reference about IMF revision in breast reduction.

**Changes in the text:** we added a reference (see Page 9, line 13).

**Comment 3:** There are too many tables.

**Reply 3:** Thank you for your professional comment. The article had four tables, so we have changed the previous Table 1 to Supplementary Table 1.

**Changes in the text:** The Table 1 was changed to Supplementary Table 1 (see Page 6, line 9).

#### ***Reviewer B***

**Comment 1:** I think that this is a good article - the only thing that I would recommend is that the authors expand on the fact (that they point out) that the prone position is a limitation - it means that the usual definition of "projection" is different from the prone

position measurements. It would also be important to point out that the level of the IMF may be elevated by the prone position - we do know that the IMF is elevated when the arms are elevated - and it is likely that the IMF is also elevated when the patient is prone compared to standing.

**Reply 1:** Thank you for your professional comment. The prone position is indeed a limitation of our study. Due to gravity in the standing position, the breasts hang naturally with the breast tissue shifting downwards. When in the prone position, the breast tissue is affected by gravity, causing an increase in breast projection and elevation of the IMF. Therefore, there would be a difference in some breast parameters between the standing and prone positions. However, the patient is usually in the supine position during breast surgery which will also result in an elevation of the IMF compared to the standing position. Although this study was in the prone position, knowledge of the IMF is still instructive for mammoplasty surgery.

Body position is a general limitation of IMF studies. The cadaveric autopsy study was usually performed in the supine position[1], and the CT study was also in the supine position[2]. The MRI study should be conducted in the prone position, and previous study has also reported the use of MRI to investigate the IMF in Brazilian women[3]. 3D scans allow the study of the IMF in the standing position; however, 3D scans only provide surface imaging and cannot provide insight into the internal tissues[4]. Thus, in this study, we have added some descriptions of the limitations of the prone position in the discussion section.

Thank you again for your comment.

**Changes in the text:** we added some statements in results section: “Compared to the standing position, the IMF may be slightly elevated in the prone position due to gravity” (see Page 11, line 3).

### ***Reviewer C***

**Comment 1:** In their study the authors evaluate breast diameters and especially inframammary fold thickness by means of MRI scan in 240 breasts from 120 Asian woman. They differentiate the thickness in central, medial and lateral and find a moderate positive correlation between central IMF thickness and breast projection. The statistics are sound and conclusive.

**Reply 1:** Thank you for your approval and professional comment.

**Changes in the text:** None.

**Comment 2:** Concerns: The study lacks a defined focus. I understand that detailed knowledge of IMF composition is essential, but the average thickness of IMF seems rather irrelevant. A "moderate" correlation between central IMF thickness and breast projection can be found - personally I also suspect a strong correlation between IMF thickness and thickness of subcutaneous layer or patients' BMI...

**Reply 2:** Thank you for your professional comment. We apologize for the unclear description of the correlation between IMF thickness and body or breast measurements. Indeed, we found a moderate positive correlation between IMF central thickness and breast projection ( $r = 0.559$ ,  $P < 0.001$ ) or breast volume ( $r = 0.523$ ,  $P < 0.001$ ). We also found a statistically significant positive correlation between IMF central thickness and body weight ( $r = 0.227$ ,  $P < 0.001$ ) or BMI ( $r = 0.186$ ,  $P = 0.004$ ), although the correlation was weak ( $r < 0.3$ ). As you mentioned, patients with a higher BMI usually have a greater thickness of the subcutaneous layer. However, there is variation in breast size among patients with the same BMI. This may explain the positive but weak correlation between IMF thickness and BMI. Similarly, the correlation between IMF thickness and BMI was not significantly linear in previous study[3].

**Changes in the text:** we added some statements in results section: "IMF central thickness showed a weak positive correlation with body weight ( $r = 0.227$ ,  $P < 0.001$ ), or BMI ( $r = 0.186$ ,  $P < 0.01$ )" (see Page 7, line 1).

**Comment 3:** Possibly, the results concerning the IMF position in Asian woman may be of interest - especially if they suspect differences to other ethnic groups. Unfortunately, this is not discussed in further detail.

**Reply 3:** Thank you for your professional comment. We apologize for not discussing in detail the differences in IMF results by ethnic group. IMF thickness and IMF location are the focus of our research. Our results indicated that the IMF thickness was positively correlated with breast volume, breast width, and breast projection. Thus, a major reason for ethnic differences in IMF may be breast size. Breast volume varies considerably among women of different ethnicities. The five nations that reported the largest current breast size were, in ascending order, the Netherlands, Egypt, the United Kingdom, India, and Pakistan, whereas the nations reporting the smallest current breast size were Japan, China, Thailand, Malaysia, and Germany[5]. In this study, the mean thickness in the

central aspect of IMF was measured as  $1.50 \pm 0.59$  cm, while a study of Brazilian women measured a larger IMF thickness of 2.40 cm[3]. This may be due to the larger breast size of Brazilian women compared to Asian women[5].

However, we did not find a correlation between IMF location and breast parameters, which is similar to the finding of the CT study[2]. In previous studies, the rib is a convenient anatomical landmark for locating the IMF, while it is unclear which rib is most relevant to the IMF. Handel et al. proposed that the IMF extended a semicircle from the sternum to the midaxillary line over the second to sixth ribs[6]. Bayati et al. identified the IMF derived along the periosteum of the fifth and sixth rib[7]. Muntan et al. reported that the IMF was located between the sixth and seventh ribs in the midclavicular line[8], while Takaya et al. observed the fascia from the dermis joined the deep fascia at the fourth and fifth rib[1]. A recent study used chest CT to locate IMF and confirmed that the IMF was located nearest to the sixth rib[2]. In this study, we found that the IMF was most frequently located at the fifth intercostal space. Overall, most studies suggest that the IMF is located around the sixth ribs, but there is some variation between studies. Due to the small sample sizes included in previous studies, we are unable to conclude that IMF location and race are related at present.

Thank you again for your comment.

**Changes in the text:** The statements of “However, a study of Brazilian women measured a larger IMF thickness of 2.40 cm, which may be due to ethnic differences (10)” were corrected as “However, a study of Brazilian women measured a larger IMF thickness of 2.40 cm than our data (10). This may be due to ethnic differences, as previous research has shown that Brazilian women have larger breast sizes than Asian women (22)” (see Page 9, line 16).

#### ***Reviewer D***

**Comment 1:** Can you comment on how the prone position could have affected your measurements? As you know, the prone position is not how breast shape is usually evaluated.

**Reply 1:** Thank you for your professional comment. The prone position is indeed a limitation of our study. Due to gravity in the standing position, the breasts hang naturally with the breast tissue shifting downwards. When in the prone position, the breast tissue is affected by gravity, causing an increase in breast projection and elevation of the IMF. Therefore, there would be a difference in some breast parameters

between the standing and prone positions. However, the patient is usually in the supine position during breast surgery which will also result in an elevation of the IMF compared to the standing position. Although this study was in the prone position, knowledge of the IMF is still instructive for mammoplasty surgery.

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Thank you again for your comment.

**Changes in the text:** we added some statements in results section: “Compared to the standing position, the IMF may be slightly elevated in the prone position due to gravity” (see Page 11, line 3).

#### **References:**

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