

## **How to Preserve Complete Breastfeeding Function in Breast Reduction and Lifting Mammoplasties**

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### **ABSTRACT**

Breastfeeding has been shown to provide considerable benefits to newborn and maternal health. The World Health Organization recommends exclusive breastfeeding of babies up to six months of age. It is well known that breast reduction techniques that preserve the column of subareolar breast tissue have a greater likelihood of successful postoperative breastfeeding. The best representative of these techniques is the Total Posterior Pedicle breast reduction which was described by Richard Moufarrege since 1982. It consists of dissecting the skin away from the breast tissue offering free access to all breast quadrants. This technique is known for its robust blood supply to the nipple areolar complex, the preservation of the nipple areolar complex sensation, and for its low rate of long-term complications such as pseudoptosis. In this article, we demonstrate that the Moufarrege Total Posterior Pedicle preserves breastfeeding function in women undergoing breast reduction using this technique.

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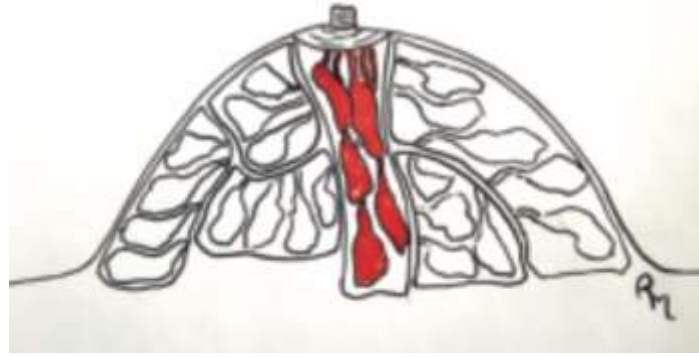
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### **1- INTRODUCTION**

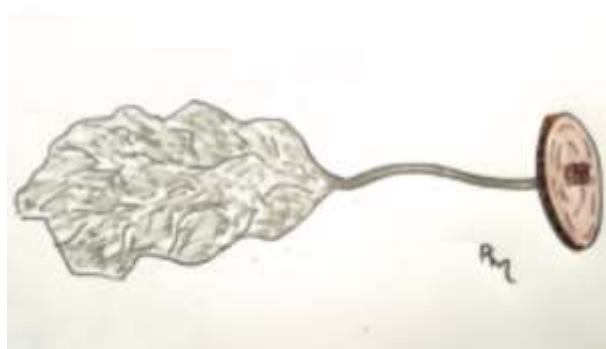
We start from the proven principle that to ensure normal lactation there are two necessary conditions: a hormonal condition which is not part of the challenges of this article and two physical conditions (1). The physical conditions are the presence of a generator tissue capable of secreting milk necessary for lactation and the presence of drainage channels capable of transporting the milk produced in specialized islets to the nipple (2). It is known that the secretory tissue of the breast, if separated from the rest of the gland, can no longer convey the milk it produces to other areas of the breast. The milk ducts do not regenerate if they are cut even if the sequestered tissue produces milk (3) (fig. 1). From this, it can be understood that for the remaining gland after breast reduction to be able to provide satisfactory lactation, it must not only constitute a consistent glandular mass to ensure the volume of milk necessary, but also must have milk ducts in communication with the nipple areola complex (fig. 2). In traditional breast reduction techniques, the first condition is present, but the second, the way of getting milk to the nipple,

is not. We realize that just the portion of glands included in the pedicle can see its secretion of milk drain by the nipple. However, the pedicles of traditional techniques contain very little glandular tissue compared to all the areas of sequestered glands which do not have the means to convey milk to the nipple (4,5). Among the latter, only the Mckissock and Robbin pedicles have the capacity to play a role, however small, in lactation since these active pedicles constitute respectively 15% and 25% of the volume of the remaining breast (6,7) (fig. 3). Consequently, the breastfeeding they are supposed to provide must represent 15% and 25% of what the breast could have produced as milk. The superior pedicles contain very little, if any, breast tissue (8,9) (fig. 4). The quality of breastfeeding after surgery with these pedicles is necessarily zero or poor. The posterior central (septal) pedicles may contain breast tissue with some modest lactogenic performance, but the breast volume they contain is extremely limited, resulting in very insufficient breastfeeding, if it exists (10) (fig. 5).

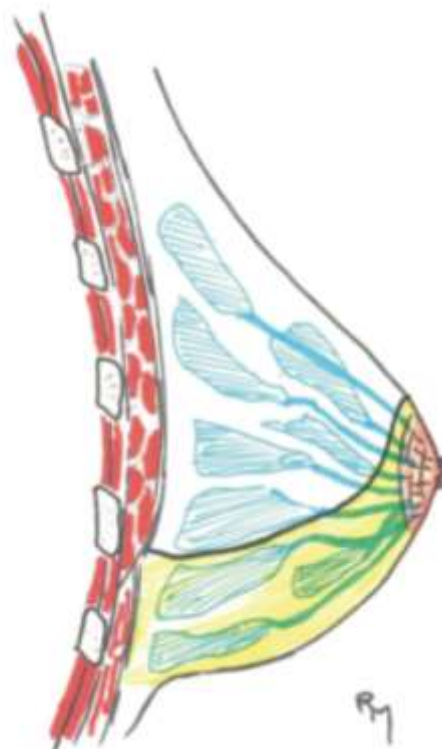
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**Figure 1: Only lactogenic units with intact lactophoric ducts draining into the nipple (red in the above drawing) can contribute to breastfeeding. One can see the sequestered parcels of gland (here, in black and white) containing no lactophoric connections thus constituting only a volume without particular function.**



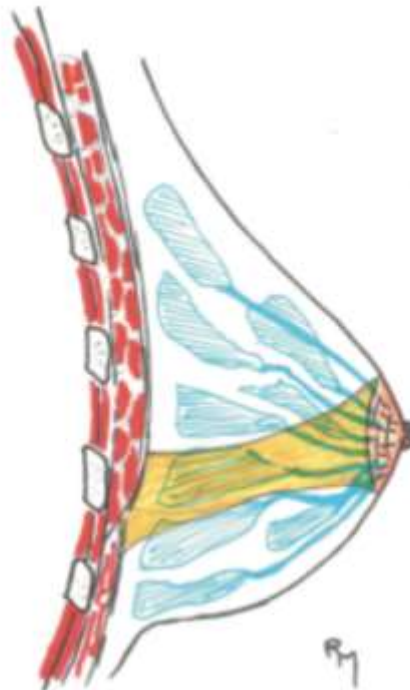
**Figure 2: The lactogenic system containing the secretory lobule, the lactophoric duct and the nipple in continuity.**



**Figure 3: McKissock's and Robbin's inferior pedicles respectively contain 15% and 25% of the remaining gland; the other 85% and 75% are sequestered under the skin without any connection with the NAC. Thus, these two pedicles provide only 15% or 25% of the normal breastfeeding capacity. The remaining 85% and 75% of milk production will not drain into the NAC and do not contribute in breastfeeding.**



**Figure 4: Traditional breast reduction techniques (here the superior pedicle) have little chances of containing substantial lactogenic units and ducts. The large majority of lactogenic tissues cannot deliver their production to the NAC.**



**Figure 5: Central posterior pedicles have a very limited capacity of containing lactogenic units draining in the NAC. As in all other traditional techniques, the remaining functional gland is restrained from delivering its produced milk.**

## **2- PHYSIOLOGY OF BREASTFEEDING IN THE MOUFARREGE TOTAL POSTERIOR PEDICLE**

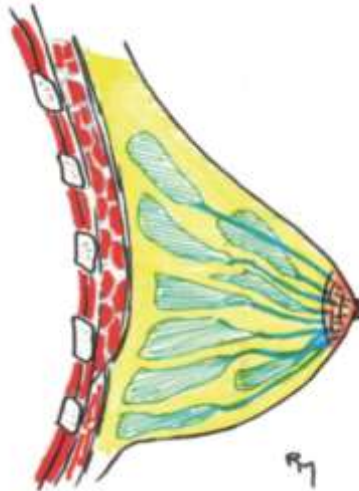
The reduction mammoplasty with the Total Posterior Pedicle is distinguished by its reliability, its safety and its ability to give satisfactory results both in functional and aesthetic terms (11,12). We consider this intervention easy to teach residents,

methodical and quick, the procedure being able to be executed within about sixty minutes for both breasts. Designed with the intention of correcting the shortcomings of other traditional pedicle types, such as that of pseudo-ptosis of the lower pedicle, the torsional effect of the median and lateral pedicles, the lack of vascularization and the limitation

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of excursion with the upper pedicles, as well as the loss of sensory nerves and perforating arteries associated with traditional reductions, the pedicle in the Moufarrege Mammoplasty is not twisted in any way when it is positioned in its new location (13). The preservation of functions following the Moufarrege Total Posterior Pedicle mammoplasty, and in particular, with regard to this article, the ability to provide normal breastfeeding are other reasons which confirm the superiority of this pedicle (14) (fig. 6). These three characteristics are met in the Total Posterior

Pedicle technique over all other traditional techniques. The purpose of this article is to demonstrate that patients undergoing a reduction mammoplasty with the Total Posterior Pedicle remain able to feed their baby exclusively with breast milk for the recommended duration of six months. In fact, the World Health Organization (WHO) recommends a minimum of six months of exclusive breastfeeding to promote optimal health in children (15). No analysis has so far evaluated the success of breastfeeding for such a period after a mammoplasty performed with any type of pedicle.



**Figure 6: The Moufarrege Total Posterior Pedicle, sagittal section. The Total posterior pedicle allows all galactophoric acinis in the remaining gland to drain normally in the NAC.**

### 3- PATIENTS AND METHODS

Our study is based on data from patients who provided written informed consent. The model is also approved by an institutional evaluation committee and follows the requirements of the Helsinki declaration. The inclusion criteria for this study are in accordance with the requirements of the Government of Quebec regarding breast reduction of a minimum of 250 g per breast. All patients over 35 years have normal mammogram results before surgery. A written survey was sent to all the patients on whom a Moufarrege Total Posterior Pedicle reduction mammoplasty was performed between the years 1981 and 1997. The purpose of the questionnaire was to ask patients about their ability to breastfeed adequately before and after their reduction mammoplasty. We asked patients to describe the quality of their lactation and breastfeeding capacity and to compare the preoperative and postoperative capacity. The reasons for the decision not to breastfeed, based on personal or psychological factors, were not assessed in this study. We also assumed that comparing the responses of our patients with those of women in the general Quebec population eliminates any possibility of psychological bias.

#### Statistical analysis

A paired t-test, allowing intergroup comparisons, was used to compare continuous variables such as the duration of breastfeeding. The results were then compared with values from the general Quebec population using a sample of women

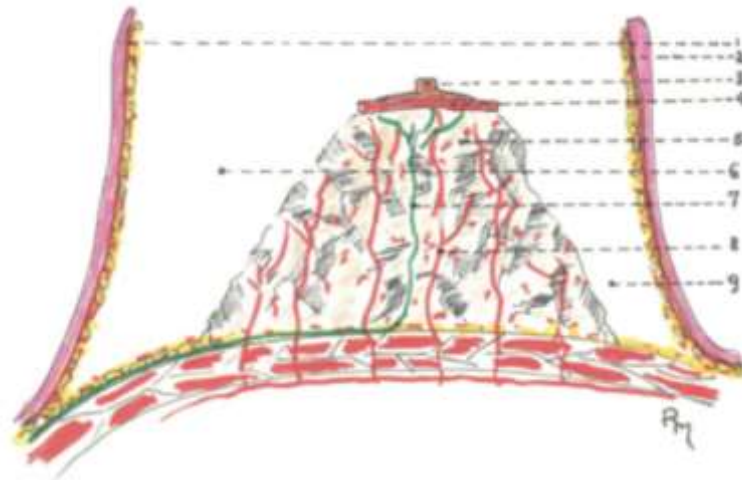
(n = 2223) who participated in the longitudinal study of the development of Quebec's children (ELDEQ 1998-2002). An X2 test was performed to compare the categorical variables. Values are considered to be statistically significant at P less than 0.05.

#### Surgical technique

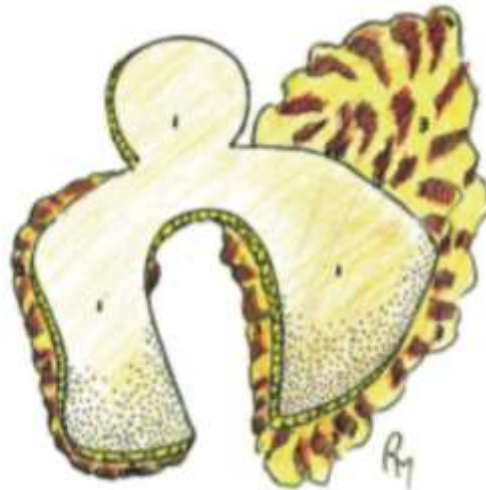
All the breast reduction cohort were performed under general anesthesia by the same surgeon. The surgery is performed according to the technique described by Dr Richard Moufarrege (12,13). However, we consider it judicious to summarize here pertinent principles regarding the technique: The breast to be reduced is completely denuded anteriorly, being still attached posteriorly on the hemithorax muscular wall. Reduction is performed through an open sky sculpture removing a very modest amount of the internal quadrant and mainly the totality of the external quadrant including the Spence tail. The whole remaining gland after reduction constitutes the Nipple Areola Complex pedicle. The way the sculpture is executed is very important to describe in this chapter. The gland resection is performed along a separation plan starting at the medial and lateral limits of the dermal pedicle, spreading away on both sides of the pedicle as it goes deeper in the breast toward the breast attachments on the muscle wall. The transverse section of the pedicle, which is in the same time the remaining breast, has the shape of an Aztec pyramid (fig. 7). The majority of the resected breast

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tissue in excess is located on the external quadrant and, to a lesser extent, the internal one (figs. 8 and 9).



**Figure 7: Transverse section of the Total Posterior Pedicle after resection with its Aztec pyramidal shape. 1: Elevated skin. 2: Subcutaneous fat. 3: Nipple. 4: Delineated areola. 5: Remaining breast gland constituting the Total Pedicle. 6: Space liberated by the outer quadrant resection. 7: Intercostal nerve. 8: Perforator arteries. 9: Space liberated by the inner quadrant resection**



**Figure 8: Anatomical piece after breast resection. 1: Skin. 2: Inner quadrant of breast. 3: Outer quadrant of breast. 4: Spence tail.**



**Figure 9: The Moufarrege Total Posterior Pedicle. Cross section of the breast showing the delimitation of the glandular resections leaving in the center a breast block retaining all its vascular, nervous and lactophoric structures from the muscular wall to the nipple-areola complex.**

### 4- RESULTS

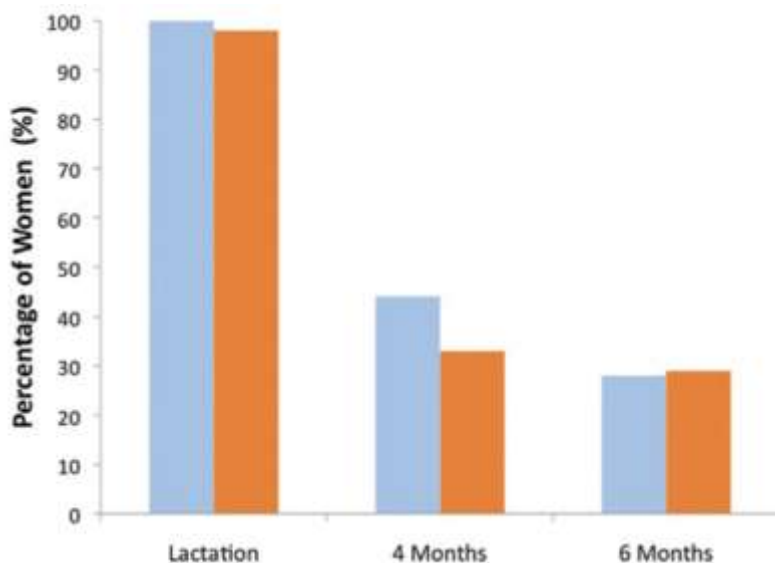
A total of 927 patients who underwent reduction mammoplasty with the Moufarrege Total Posterior Pedicle by the same surgeon were approached for the study. The survey participation rate was 61.7% with 571 independent responses. The patients were 32.8 years old on average at the time of

surgery (14–82 years). The mean duration of follow-up was 20.8 years. A total of 146 women breastfed of which 48.6% (n = 71) breastfed preoperatively and 54.8% (n = 80) breastfed after their reduction mammoplasty. About half of the patients (N = 75) had not breastfed preoperatively and 98% of these women (n = 73) successfully breastfed

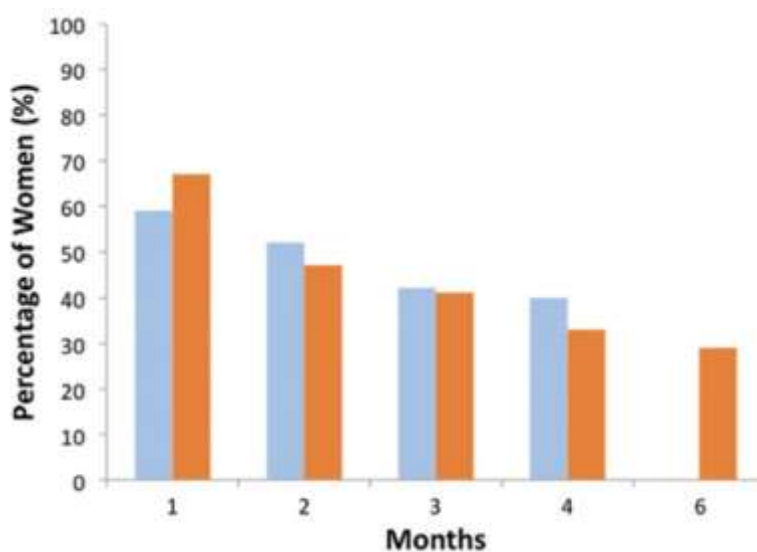
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postoperatively. When analyzing reported breastfeeding capabilities, there is no statistically significant difference between the percentage of women who are able to successfully breastfeed preoperatively versus postoperatively (98% vs 100%, respectively;  $p = 0.2$ ). The proportion of women who underwent the Moufarrege Breast Reduction and

who were able to breastfeed successfully is not statistically different from that of the sample representing the general population of Quebec for breastfeeding durations of one month (59% vs 67%,  $p = 0.07$ ), two months (52% vs 47%,  $p = 0.37$ ), three months (42% vs 41%,  $p = 0.92$ ), and four months (40% vs 33%,  $p = 0.13$ ) (figs 10 and 11).



**Figure 10:** The percentage of women who have successfully breastfed. Pale blue: preoperative; orange: post-operative. No statistically significant difference was found when comparing the percentages of women able to breastfeed before and after Moufarrege type breast reduction ( $p=0.2$ ). This trend has been observed at all stages from the birth of the baby to four and six months postpartum.



**Figure 11:** The percentage of women able to breastfeed at different stages. Pale blue: the sample of women from the general population of Quebec who are able to breastfeed; Orange: the sample of women who have undergone a Moufarrege type breast reduction and who are able to breastfeed. There was no statistically significant difference between the two groups at one, two, three or four months following breast reduction.

### 5- DISCUSSION

Several health benefits associated with breastfeeding have been documented over the years in the medical literature. Exclusive breastfeeding that contributes to the well-being of both mother and child should last for the first six months as recommended by WHO (15). Breastfeeding not only meets the caloric needs of the growing child, it also boosts their

immune system, which reduces the possibility of death from infectious diseases. There has also been a decrease in postpartum bleeding, a decrease in breast cancer and ovarian cancer in breastfeeding women. As more and more women are aware of the medical benefits of breastfeeding, it is not surprising that these women want to learn about the potential

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impact that breast reduction can have on their ability to breastfeed (16,17).

A literature review on 26 studies published between 1950 and 2008 shows a variation in breastfeeding success rates ranging from 36 to 60% after reductions in all techniques (7). All these studies seem to suffer from a lack of rigor either in terms of the duration of breastfeeding which seems, in all of these studies, to be less than the 6 months recommended by WHO, or in terms of the quality of lactation in terms of insufficient milk for efficient nutrition for the baby's health. This review allowed us to reach the general conclusion that the variations observed for the success of preoperative breastfeeding versus postoperative are probably due to the use of an imprecise definition of the terms "lactation" and "breastfeeding", use of random comparables and inadequate follow-up periods.

Our study uses the terms lactation and breastfeeding as defined by the WHO (15). The term lactation is defined by the ability to let down milk from the breast nipple, while the term breastfeeding is defined as exclusive feeding of the breast milk for the stated duration. In order to adequately compare the breastfeeding rates among women who have undergone breast reduction and that of the general population of Quebec, we have issued a recommendation using an evidence-based approach in order to obtain a higher quality methodology for this study. This methodology allows a better correlation between cause and effect. This study compares not only the success of preoperative and postoperative breastfeeding in the context of a Moufarrege type Reduction Mammoplasty, but also the postoperative breastfeeding rates with those of the general Quebec population. In addition, this study includes a follow-up period of 13 to 19 years, which allows an adequate average time for pregnancy and childbirth in our patients. The fact that only one surgeon performed all the procedures further minimizes the possible biases and reinforces the results obtained in the study. Our series is made up of a large sample, which also helped maximize the power of the study and reduce statistical errors.

### 6- CONCLUSION

Reduction Mammoplasty with the Moufarrege Total Posterior Pedicle does not cause adverse effects to breastfeeding. Our survey has shown an equal efficiency in breastfeeding as in the general population. It would therefore be entirely advisable to favor this surgery with this pedicle in anyone wishing to breastfeed after breast reduction.

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