

Stripping out pus in lactational mastitis: a means of preventing breast abscess

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Objective: To determine whether manual stripping of pus from the breasts of women with lactational mastitis is effective in preventing the formation of breast abscesses.

Design: Case series (chart review).

Setting: Family practice in Montreal.

Patients: All (475) charts of patients with lactational mastitis were reviewed; 61 women were excluded because they already had a breast abscess. Most of the patients had been referred.

Outcome measures: Abscess formation, length of illness after treatment, rate of recurrence of mastitis, illness in the mother or infant within the 6 weeks after the mastitis and continuance of breast-feeding.

Main results: The duration of symptoms before treatment was 1 to 56 (mean 5.3) days. In 9% of the cases both breasts were affected, and in 23% at least one episode of mastitis had previously occurred. The stripping technique was applied to all the patients. Pus was removed in 210 women; the remaining women were considered to have cellulitis. Only four patients (less than 1%) had breast abscesses. The mean length of illness after treatment was 7.2 days. The rate of recurrence was 14%. In all, 6% of the mothers and 9% of the infants became ill in the 6 weeks after the mastitis. Most (92%) of the patients continued to breast-feed.

Conclusions: The rate of abscess formation was considerably lower than the rates reported in the literature. Therefore, manual stripping of pus from the infected breasts of lactating women appears to be effective in preventing breast abscesses.

Objectif : Déterminer si la décortication manuelle du pus des seins de femmes atteintes de mastite de l'allaitement réussit à prévenir la formation d'abcès aux seins.

Conception : Série de cas (examen des dossiers).

Contexte : Pratique familiale à Montréal.

Patientes : On a examiné tous les dossiers (475) de patientes souffrant de mastite de l'allaitement. On en a exclu 61 parce qu'elles avaient déjà des abcès aux seins. La plupart des patientes avaient été présentées.

Mesures des résultats : Formation d'abcès, durée de l'infection après le traitement, taux de récurrence de la mastite, maladie chez la mère ou le nouveau-né dans les 6 semaines suivant la mastite et continuation de l'allaitement.

Principaux résultats : La durée des symptômes avant traitement était de 1 à 56 (moyenne 5,3) jours. Dans 9 % des cas, les deux seins étaient infectés, et 23 % des patientes avaient connu au moins un épisode antérieur de mastite. On a appliqué la technique à toutes les femmes; on a enlevé du pus chez 210 d'entre elles. On a considéré que les autres souffraient de cellulite. Quatre patientes seulement (moins de 1 %) avaient des abcès aux seins. La durée moyenne de l'infection après le traitement a été de 7,2

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jours. Le taux de récurrence s'est établi à 14 %. Au total, 6 % des mères et 9 % des nouveau-nés sont tombés malades dans les 6 semaines suivant la mastite. La plupart (92 %) des patientes ont continué d'allaiter.

Conclusions : Le taux d'apparition des abcès a été très inférieur à ceux mentionnés dans les publications. La décortication manuelle du pus des seins infectés des femmes qui allaitent semble par conséquent réussir à prévenir l'apparition d'abcès aux seins.

Puerperal mastitis affects 1% to 9% of lactating women.¹⁻³ It presents in three ways: as cellulitis,⁴ when the infection involves the connective tissue between the milk ducts; as adenitis,⁴ when the space within the ducts is infected; and as an abscess, when the infection has become loculated. Adenitis develops in about 24% of women with cellulitis, and breast abscess occurs in 5% of those with mastitis.¹

Patients with mastitis present with fever and a hot, erythematous, painful, indurated area in the breast.¹ In those with adenitis the pus can be extruded from the milk ducts,⁴ and the milk shows high bacterial concentrations (10³ bacteria per cubic millilitre of milk).⁵ Bacteria are also grown from the milk of women with cellulitis.^{1,5,6} When an abscess has formed, a fluctuant mass can be felt in the breast, and a fluid-filled cavity can be detected by means of ultrasonography.

The rate of abscess formation is 0% among patients with cellulitis and 3.6% among those with adenitis.⁵ Low abscess rates (0% to 12%) occur when antibiotic therapy is applied immediately after diagnosis (i.e., before the ducts are closed by pus).^{5,7-12} High abscess rates (8% to 67%) are usually associated with delays of over 2 days in starting antibiotic therapy.^{5,7,12,13} Weaning^{1,14} impairs the flow of milk and leads to abscess formation even with the use of antibiotics.^{1,15-19}

The most widely used treatment of mastitis involves antibiotic therapy, frequent nursing and the expression of milk by hand.^{5,14,20-22} This treatment works well in the early stages of mastitis since antibiotics flow freely to the infected areas. However, once pus has formed and plugs the ducts nursing and the manual expression of milk are not powerful enough to dislodge the pus, and antibiotics fail to reach the infection.

We undertook this study to determine whether the stripping of pus from breasts of women with adenitis is effective in preventing abscesses. The resultant freeing of the ducts would permit the flow of milk, which neutralizes and evacuates the infection. The technique has been used in animal husbandry.²³ However, a search of MEDLINE and FAMILI in March 1990 failed to produce a single reference to its use in humans. In addition to describing the technique we compare its success with that of conventional treatment in preventing abscess formation.

Methods

Patient population

We reviewed the charts of all women with lactational mastitis presenting to a family practice in Montreal from 1975 to 1983. We collected the following information: source of referral, age of infant, factors preceding the onset of mastitis, symptoms and their duration before and after the first visit, use of antibiotics, hot compresses and bed rest, nursing frequency, abscess formation, number of admissions to hospital, illnesses in mother or infant in the 3 days before and the 6 weeks after the mastitis, recurrences, total duration of breast-feeding and results of bacterial cultures.

All lactating women with symptoms of pain, erythema or induration in a segment of the breast as well as a temperature of at least 38°C or the expression of pus from the breast or both were defined as having mastitis and were included in the study. We excluded women who presented with a fluctuant mass in the breast, indicative of a breast abscess, necessitating incision and drainage. All women with mastitis consented to the stripping procedure.

Stripping technique

In preparation for the procedure all patients were asked to nurse their infant from the affected breast. This facilitated examination and stripping by reducing the quantity of milk in the breast. Superficial palpation of the breast with the patient in a supine position was done to establish the extent of induration and rule out abscess.

The breast was then lubricated with sterile gel. The thumb was pressed firmly into the breast distal to the area of induration (i.e., the breast tissue was squeezed between the thumb and the rib cage). With downward pressure maintained the thumb was moved slowly and radially toward the nipple. When the areola was reached, the index finger was placed on the side of the areola opposite to the thumb, and the two digits were used to squeeze upward to the tip of the nipple. The index finger acted as a brace for the thumb. The entire procedure was repeated at least three times until only milk was expressed.

Pus differed from milk in that it was mucus-like, gelatinous, curd-like or semisolid and did not flow.

The colour of pus varied from creamy yellow to green, opaque to translucent.

One of the most important parts of the stripping procedure involved the squeezing upward with the thumb and index finger along the length of the nipple. If this was not done pus accumulated in the lactiferous sinuses and was not extruded.

Because the procedure could be painful, particularly at the outset when semisolid pus was extruded through the narrow milk ducts, gentle, slow movements were used along with steady, uniform pressure. Once the ducts had dilated the pain abated and the stripping continued with only mild discomfort. If the pain was too great patients received 50 to 100 mg of meperidine intramuscularly. Total clearing of the pus from the breast gave most patients dramatic pain relief. Patients helped during the late stages of the procedure by pointing out painful areas, which indicated the location of remaining pockets of pus.

On average, the procedure took about 15 minutes. But when large areas were affected, it lasted as long as an hour. A more detailed description of the procedure has been previously published.²⁴

After the treatment patients were instructed to continue nursing and to strip the affected area after each feeding, usually every 2 to 4 hours.

Use of antibiotics

Patients already taking antibiotics were instructed to continue using them if their symptoms were subsiding. If their symptoms were unchanged or getting worse other antibiotics were prescribed according to culture results.

Patients not already taking antibiotics received them if they had extensive mastitis, a purulent discharge from the nipple before the stripping procedure or cracked nipples, were weaning or were nursing at prolonged intervals. The antibiotics were cloxacillin and erythromycin (each 250 mg four times daily). If sensitivity test results or drug reactions warranted, patients were given amoxicillin (250 mg three times daily), cephalexin (250 mg four times daily) or trimethoprim-sulfamethoxazole (1 tablet twice a day).

Patients not given antibiotics were asked to report back in 24 hours for a prescription of antibiotics, determined according to culture results, if their symptoms did not subside. Women who chose to wean their infant received bromocriptine, 0.625 to 2.5 mg twice a day for 2 weeks.

Bacterial culture

Samples of milk or pus were expressed onto sterile swabs, which were then placed in sterile containers. The patients were asked to bring the

containers to local private laboratories for aerobic culture and sensitivity analysis.

Surgical treatment of abscesses

Patients were seen repeatedly if their symptoms persisted. When abscesses developed they were drained surgically in the physician's office.

Follow-up

Two weeks after the last visit the patients were asked to complete a questionnaire over the telephone.²⁵ Cure was indicated by the complete absence of symptoms (fever, pus in the milk ducts, erythema, induration and pain) for at least 24 hours. Once a year by telephone an independent interviewer contacted all of the patients still nursing at last report to determine the incidence of late complications and recurrences and the duration of breast-feeding.

Statistical analysis

Multiple regression analyses were performed to determine whether patient characteristics and treatments (predictors) significantly affected the outcome of the mastitis. The outcome measures used were abscess formation, length of illness after stripping, recurrences and illnesses in the mother or the infant in the 6 weeks after the mastitis.

Results

A total of 414 women were included in the study. The symptoms and their duration before presentation are shown in Table 1. The patients were ill 1 to 56 (mean 5.3) days before their first visit; most of the women presented with pain, fever and induration.

Most (94%) of the patients had been referred because conventional therapy had failed (Table 2); 30% had been symptomatic for 6 days or more. Almost half (42%) of the women had cracked nipples, and one-third of one breast was infected on

Table 1: Duration of symptoms in 414 women with mastitis before their first visit

| Symptom | No. (and %) of women | Mean duration (and SD*), d |
|------------|----------------------|----------------------------|
| Pain | 412 (99) | 4.9 (4.0) |
| Fever | 389 (94) | 3.7 (3.1) |
| Induration | 340 (82) | 4.6 (4.4) |
| Erythema | 326 (79) | 3.9 (3.7) |
| Pus | 157 (38) | 2.1 (2.0) |
| Mastitis† | 414 (100) | 5.3 (4.8) |

*SD = standard deviation.

†From the onset of the first symptom to the first visit.

average. By the time of the first consultation 23% of the patients had had one or more previous episodes of mastitis.

At the first visit the breasts of all of the patients were stripped. In 210 cases pus was produced, and the patients were classified as having adenitis. No foul-smelling pus was found. In the remaining 204 cases there was no visible pus, and the women were classified as having cellulitis. Eleven (3%) of the women required analgesic therapy during the stripping procedure.

After the initial visit the patients stripped their breasts according to the instructions; 153 (73%) of those with adenitis continued to express pus from their nipples after the initial procedure. However, for 90% of these women the pus extrusion ceased within 1 week.

Most of the women used bed rest and hot compresses, and almost half nursed more frequently than usual (at least every 2 hours) (Table 3). Antibiotics were given to 189 (46%) of the women, 66 before the first visit and 123 at the first visit. Changes in antibiotic therapy were effected most often at the first visit, when cloxacillin or erythromycin was prescribed instead of amoxicillin or penicillin. Of the 226 patients who did not receive an antibiotic at the initial visit, only 1 reported that her symptoms had not subsided; she was given an appropriate antibiotic. Of the 35 women who decided to wean their infant at or before the first visit, 20 received bromocriptine.

In all, 222 women (132 with adenitis, 90 with cellulitis) took their milk or pus sample to a laboratory for culture. Samples from the patients with

Table 2: Characteristics of the patients and their infants at the first visit

| Characteristic | Value | Range |
|---|-------------|--------|
| Mean age (and SD), yr | 28.6 (4.4) | 19-43 |
| Mean parity (and SD) | 1.9 (1.3) | 1-9 |
| Mean no. of babies nursed (and SD) | 1.7 (1.1) | 1-8 |
| Mean age of infant (and SD), wk | 11.7 (16.2) | 1-104 |
| No. (and %) of women with problems other than mastitis in the 3 d before first visit* | 168 (41) | |
| No. (and %) of infants with problems in the 3 d before first visit† | 294 (71) | |
| No. (and %) of women referred because of failed conventional treatment | | |
| By physician | 49 (12) | |
| By LLL or PHN‡ | 338 (82) | |
| No. (and %) of women with one or more previous episodes of mastitis | 96 (23) | |
| Mean no. of previous episodes of mastitis (and SD) | 1.5 (0.3) | 1-15 |
| Mean duration of mastitis before first visit (and SD),§ d | 5.3 (4.8) | 1-56 |
| Duration of mastitis before first visit, no. (and %) of women | | |
| < 3 d | 43 (10) | |
| 3-5 d | 246 (59) | |
| > 5 d | 125 (30) | |
| No. (and %) of women with | | |
| Adenitis (pus stripped from breast) | 210 (51) | |
| Cellulitis (no pus stripped) | 204 (49) | |
| Mean area of breast involved (and SD),¶ % | 33.2 (24.4) | 10-100 |
| No. (and %) of women with both breasts infected¶ | 30 (9) | |
| No. (and %) of women with cracked nipples | 176 (42) | |
| No. (and %) of women who had weaned infant before first visit | 19 (5) | |
| No. (and %) of women who weaned infant at first visit | 16 (4) | |

*Problems were anemia (in 35), hyperthyroidism or hypothyroidism (in 14), diabetes (in 9), upper respiratory tract infection (in 53), boils or pustules (in 33), diarrhea (in 14) and other (in 60); 44 mothers had more than one illness.

†Problems were pimples (in 146), diaper rash (in 74), upper respiratory tract infection (in 57), thrush (in 47), failure to thrive (in 16), prematurity (in 14), diarrhea or vomiting (in 12) and other (in 72); 110 infants had more than one illness.

‡LLL = La Leche League leader, PHN = public health nurse.

§From the onset of the first symptom to the first visit.

¶This information was recorded in 330 of the 414 charts.

adenitis were more likely than those from the patients with cellulitis to grow both *Staphylococcus pyogenes* (67 [51%] v. 31 [34%]) and β -hemolytic *Streptococcus* (6 [4%] v. 1 [1%]) ($r = 0.19, p < 0.001$). For the women whose culture and sensitivity results were available 66 received an appropriate antibiotic the first time; in 29 cases the first antibiotic chosen did not correspond to the sensitivity results. The remaining 127 women did not receive antibiotics.

Only four breast abscesses developed, a rate of less than 1%. There were no abscesses in the 289 cases in which the breasts were stripped within 5 days after the onset of the disease or in the 204 cases in which cellulitis was diagnosed.

The four women in whom an abscess developed had been ill with adenitis from 6 to 14 days before the first consultation; three had cracked nipples and engorged breasts. Three had been taking antibiotics (erythromycin by two and cephalexin by one) when first seen and were told to continue taking them. The fourth patient was given cloxacillin at the first visit. In all cases the pus grew *Staphylococcus aureus* resistant to penicillin but sensitive to the antibiotics prescribed.

The median follow-up was 19 weeks; 50% of the women were followed up for 8 to 41 weeks.

The mean duration of the symptoms varied greatly, from 2 days for the expression of pus from the breast and fever to 5 days for pain in the breast (Table 4). The number of days from the start of therapy to the complete absence of all symptoms was

0 to 90 (mean 7.2 [standard deviation 8.7]) days. Table 5 shows the relation between patient and treatment variables and the duration of mastitis. Multiparous women, those who received no antibiotics and those who increased their nursing frequency recovered faster than the other patients. The course was prolonged for patients with cracked nipples or infection in over half of the breast and those whose illness had lasted more than 5 days before the stripping procedure.

The use of bed rest or hot compresses had no bearing on length of illness or rate of abscesses.

Mastitis recurred in 14% of the patients. No factors were significantly correlated with the recurrences.

Twenty-three mothers (6%) became ill in the 6 weeks after their mastitis (7 had a reaction to the antibiotic, 2 had pain on nursing, 1 had conjunctivitis, and 13 had various illnesses). Their illnesses

Table 4: Duration of symptoms after the first visit

| Symptom | No. (and %) of women | Mean duration (and SD), d |
|------------|----------------------|---------------------------|
| Pain | 382 (92) | 5.7 (5.6) |
| Fever | 254 (61) | 3.4 (3.9) |
| Induration | 307 (74) | 6.1 (5.4) |
| Erythema | 298 (72) | 5.5 (5.1) |
| Pus | 153 (37) | 5.5 (10.0) |
| Mastitis* | 414 (100) | 7.2 (8.7) |

*From the first visit to the complete absence of all symptoms.

Table 3: Treatments used in addition to the stripping procedure

| Treatment | No. (and %) of women | Mean duration (and SD), d |
|--|----------------------|---------------------------|
| Hot compresses | 330 (80) | 2.6 (2.4) |
| Bed rest | 240 (58) | 1.6 (2.1) |
| Increased nursing frequency | 188 (45) | 6.9 (3.0) |
| Bromocriptine | 20 (5) | 16.3 (10.3) |
| Antibiotics already being taken at first visit | 66 (16) | |
| Amoxicillin | 22 (5) | 5.6 (3.6) |
| Penicillin | 16 (4) | 7.5 (18.9) |
| Cloxacillin | 13 (3) | 8.0 (6.3) |
| Erythromycin | 7 (2) | 7.3 (4.0) |
| Cephalexin | 5 (1) | 5.4 (4.3) |
| Trimethoprim-sulfamethoxazole | 2 (0.5) | 7 |
| Lincomycin | 1 (0.2) | -* |
| Antibiotics given at first visit | 123 (30) | |
| Cloxacillin | 71 (17) | 10.2 (9.9) |
| Erythromycin | 52 (12) | 7.7 (2.7) |
| Antibiotics changed | 20 (5) | |
| To cloxacillin | 10 (2) | 8.7 (6.5) |
| To erythromycin | 7 (2) | 7.5 (3.0) |
| To amoxicillin | 1 (0.2) | 10 |
| To cephalexin | 1 (0.2) | 14 |
| To trimethoprim-sulfamethoxazole | 1 (0.2) | 4 |
| No antibiotics given | 225 (54) | - |

*Duration not recorded.

were significantly correlated with the extent of the mastitis ($r = 0.14$, $p < 0.01$) and the use of antibiotics ($r = 0.17$, $p < 0.001$). Thirty-eight infants (9%) became ill in the 6 weeks after their mother's mastitis: 11 had diarrhea, 6 had colic, 5 had rash, 3 had otitis media, 2 failed to thrive, 1 had oral thrush, and 10 had other conditions. Diarrhea (in 10), colic (in 4), rash (in 3) and thrush (in 1) were significantly correlated with their mother's antibiotic therapy ($r = 0.15$, $p < 0.01$).

Nineteen mothers had weaned their infant before the first visit, and another 16 decided to wean within 1 week after the first visit. All of the other women (92%) continued to breast-feed. The median duration of breast-feeding after the mastitis was 12 weeks, 50% of the mothers nursing 5 to 24 weeks.

Discussion

When pus can be extruded from the milk ducts in cases of mastitis we consider the patient to have

adenitis rather than cellulitis of the breast. These two conditions differ bacteriologically, as demonstrated by the greater number of women with adenitis than with cellulitis whose samples grew *S. pyogenes* or β -hemolytic *Streptococcus*. They also differ with respect to the likelihood of abscess formation. Abscesses developed only in cases of adenitis. We believe that the stripping procedure in the women with adenitis prevented the development of more breast abscesses than would have occurred through standard treatment.

Abscess rates in the literature are 0%^{5,19} to 12%^{23,24} when mastitis is treated within 1 to 2 days after onset. After 2 days the rates are 8%⁵ to 67%.^{14,24,25} With the use of our procedure only 4 (less than 1%) of the 414 women had an abscess. No abscess developed in the patients who had been ill within 5 days before the procedure.

Clearly many women with mastitis fail to be treated promptly or respond poorly to conventional treatment. Most (94%) of our patients were referred,

Table 5: Duration of mastitis after first visit by presentation and treatment

| Presentation/treatment | Mean duration* (and SD), d | r value |
|---|-------------------------------|---------|
| History of mastitis (n = 96) | 7.0 (10.2) | -0.01 |
| Breast-feeding ≥ 2 children (n = 187) | 5.8 (7.2) | -0.15† |
| Duration of mastitis before first visit, d | | |
| < 3 (n = 43) | 5.5 (4.3) | -0.07 |
| 3-5 (n = 246) | 6.5 (8.5) | -0.10 |
| > 5 (n = 125) | 9.2 (9.8) | 0.15‡ |
| Adenitis (n = 210) | 8.0 (10.4) | 0.09 |
| Cellulitis (n = 204) | 6.4 (6.4) | -0.09 |
| Area of breast involved, % | | |
| < 50 (n = 305) | 6.9 (8.1) | -0.06 |
| ≥ 50 (n = 39) | 11.2 (14.6) | 0.16‡ |
| Both breasts infected (n = 30/330) | 8.0 (5.7) | 0.02 |
| Cracked nipples (n = 176) | 8.4 (10.3) | 0.12† |
| Bacteria sensitive to first antibiotic (n = 66) | 9.0 (9.0) | 0.09 |
| Bacteria resistant to first antibiotic (n = 29) | 6.5 (4.8) | -0.02 |
| Culture done, no antibiotic given (n = 127) | 6.3 (10.0) | -0.11 |
| No culture (n = 192) | 7.2 (8.0) | 0.002 |
| Hot compresses (n = 330) | 7.4 (9.2) | 0.03 |
| Bed rest (n = 240) | 7.0 (8.1) | -0.02 |
| Increased nursing frequency (n = 187) | 6.0 (3.2) | -0.17‡ |
| Weaned infant on or before first visit (n = 35) | 6.7 (4.0) | -0.02 |
| No antibiotic given (n = 225) | 6.1 (9.0) | -0.14† |
| Antibiotic therapy started | | |
| Before first visit (n = 66) | 8.8 (9.5) | 0.08 |
| At first visit (n = 123) | 8.3 (7.2) | 0.08 |
| Antibiotic changed (n = 20) | 11.2 (13.8) | 0.10 |
| Total | 7.2 (8.6) | - |

*From the first visit to the complete absence of all symptoms.
† $p = 0.01$, one-tailed test.
‡ $p = 0.001$, one-tailed test.

primarily because the mastitis had not responded to the conventional therapy of antibiotics plus frequent nursing or manual emptying. The mean length of illness before the first visit (5.3 days) far exceeded that reported by others^{9,11} (Dr. Anders Thomsen: personal communication, 1988). In addition, 23% of our patients had been referred because of recurrent mastitis. The recurrence rates reported in other studies were from 6% to 18%.^{1,5,14} These rates are lower than those reported by the patients on entry to this study. It has been argued that the rate of abscess formation is higher among women with recurrent mastitis than among those with primary mastitis.^{1,6}

Our patient population comprised mainly women with prolonged or recurrent mastitis. This makes it difficult to compare our results with those of other studies in which the women had less severe disease. According to the literature, women with prolonged or recurrent mastitis are at a higher risk than others for breast abscess. Our low abscess rate strongly supports the stripping technique as an effective treatment of mastitis.

In three studies the mean length of illness varied from about 2 days¹⁰ to about 5 days.^{5,9} In our study the mean length of illness after the first stripping procedure was 7.2 days. At the first visit the women had already been ill for over 5 days and had failed to respond to conventional treatment, whereas the duration of symptoms before treatment in the three previous studies was less than 2 days.

The yearly follow-up allowed us to collect information on the rates of recurrence and illness in the mothers or their infants after the mastitis. Our recurrence rate of 14% is comparable to rates reported previously.^{1,5,14} Few of the mothers or the infants became ill after the mastitis.

The length of illness before the procedure, the presence of cracked nipples and extensive involvement of the breast were factors linked with prolonged mastitis. Multiparity and frequent nursing were associated with a shorter course. Prolonged mastitis and infection with *S. aureus* treated with antibiotics were associated with abscess formation. The women who took antibiotics and their infants were more likely than the others to be ill within the 6 weeks after the mastitis, mostly because of the side effects of the drugs. Since antibiotics were given to the more severely affected women it is impossible to determine whether the negative effects of the antibiotics on the course of the mastitis, the abscess formation and the subsequent illness in mother and infant were related to the drug therapy. Others¹⁰⁻¹² have questioned the use of antibiotics in the treatment of mastitis. Thomsen, Espersen and Maigaard,⁵ on the other hand, found that the use of antibiotics shortened the course of the infection.

The effectiveness of stripping should be established more definitively in a controlled trial. Such an experiment might also identify prognostic factors such as type, duration and location of the mastitis, as well as the efficacy of antibiotics. However, this is not possible in a general practice without injury to the well-being of patients. Nevertheless, the procedure we have described is so simple, safe and effective that it should be of interest to other physicians and their patients. We welcome comments from colleagues who have tried our suggested technique so that we might assemble further evidence of its relative merit over that of conventional treatment.

Recommendations

Stripping of the breast is recommended in all cases of mastitis until milk flow is re-established in all ducts. The mother should continue the procedure at home every 2 to 4 hours until the ducts are consistently free of pus. She should also be encouraged to continue nursing.

Cultures of milk or extruded pus should be done to choose the most effective antibiotic. If the condition has not improved within 24 hours an antibiotic should be given on the basis of the culture results.

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Conferences

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Oct. 5, 1991: Canadian Council on Smoking and Health Annual Meeting

Ottawa

Andrée Dumulon, national coordinator, Canadian Council on Smoking and Health, 400-1565 Carling Ave., Ottawa, ON K1Z 8R1; (613) 722-3419, fax (613) 725-9826

Oct. 5, 1991: Undersea and Hyperbaric Medical Society (Great Lakes chapter) 12th Annual Scientific Meeting
Toronto General Division, Toronto Hospital
Dr. Ron Linden, Ste. B-5, 4841 Yonge St., Willowdale, ON M2N 5X2; (416) 340-4481, fax (416) 340-3698

Oct. 6-9, 1991: Meeting of the International Society for Sexually Transmitted Diseases

Banff, Alta.

Department of Medicine, Health Sciences Centre, Rm. GC-430, 700 William St., Winnipeg, MB R3E 1Z2; (204) 787-2772

Oct. 6-11, 1991: 8th International Congress of Human Genetics

Washington, DC Convention Center

M. Ryan, meetings manager, ICHG, 9650 Rockville Pike, Bethesda, MD 20814; (301) 571-1825, fax (301) 530-7079

Du 9 au 11 oct. 1991 : Colloque international promouvoir la santé en francophonie — Au delà des cultures : des outils à partager (sous le parrainage du ministère de la Santé et des Services sociaux du Québec)

Hôtel Bonaventure Hilton, Montréal

Association pour la santé publique du Québec, 3958, rue Dandurand, Montréal, QC H1X 1P7; (514) 593-9939, fax (514) 725-2796

Oct. 14-19, 1991: Joint Annual Meeting of the Heart and Stroke Foundation of Canada, the Canadian Cardiovascular Society, the Canadian Council of Cardiovascular Nurses and the Canadian Association of Clinical Perfusionists

Calgary

Heart and Stroke Foundation of Canada, 200-160 George St., Ottawa, ON K1N 9M2; (613) 237-4361

Nov. 4-5, 1991: Symposium: Transgenic Animal Models in Biomedical Research

National Institutes of Health, Bethesda, Md.

Dr. George Migaki, Registry of Comparative Pathology, Armed Forces Institute of Pathology, Washington, DC 20306; (202) 576-2452, fax (202) 576-2164

Dec. 6, 1991: Association for Psychocutaneous Medicine of North America (APMNA) Meeting

Dallas

APMNA, 1812 Delancey Pl., Philadelphia, PA 19103; (215) 545-4674

Jan. 16-18, 1992: American Academy of Pain Medicine Annual Meeting

Registry Hotel, Scottsdale, Ariz.

Carol Endicott, administrative assistant, marketing, American Academy of Pain Medicine, 5700 Old Orchard Rd., 1st floor, Skokie, IL 60077-1024; (708) 966-9510, fax (708) 966-9418

May 12-16, 1992: 2nd World Conference of the Hellenic Bio-Medical Diaspora (organized by the Hellenic Medical Society of Great Britain and the Athens Medical Society as part of the 18th Panhellenic Medical Congress)

Athens

Abstract deadlines are Jan. 10 (symposia and free communication abstracts) and Apr. 10 (poster abstracts), 1992.

Conference Secretariat, Hellenic Medical Society of Great Britain, PO Box 955, London SE1 9RW, England; fax 011-44-1-071-955-4247