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Comparative Study of Open and Closed Drainage of Breast Abscess

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Abstract: *Breast abscess remains one of the major problems in both lactating and non-lactating woman worldwide. Incidence ranges from 0.5 to 11%in lactating women. In non-lactating women, the age of incidence is usually around fourth decade of life. Mainstay of treatment would be incision and drainage. In this comparative study of 60cases we are comparing open drainage vs. closed drainage of breast abscess with respect to Post-operative pain, Residual abscess, Duration of hospital, stay, Time required for complete healing and Appearance of scar. Patients were divided in to two groups with each group containing 30patients. Outcome of the study revealed closed drainage to be beneficial to the patient compared to open drainage, since it reduces overall complications and post-operative outcome is better.*
Key words: *breast abscess, open drainage, closed drainage.*

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I. Introduction:

Breast abscess is an acute inflammatory condition which results in the formation and collection of pus under the skin in breast tissue. It usually manifests as painful and erythematous swelling in the breast which may drain through the skin of nipple duct opening. Breast abscess if not treated in time and in proper way, can result in deformation of breast which ultimately can result in loss of self-esteem of the female who suffers from abscess. To put it simply Breast abscess is collection of pus in the breast; usually occur in breastfeeding woman due to trauma and mastitis. Although its common in young lactating women it can also be seen in non-lactating women having predisposing factors such as those on immune-suppression drugs or having diabetes mellitus. Though smoking is found to be one of the important risk factors as reported by many randomized controlled trials many studies have questioned the role of smoking as a predisposing cause of breast abscess. Its young lactating women who are most commonly affected by breast abscess. The incidence of abscess in young lactating women may vary from 0.5 to 11%. Staphylococcus aureus being abundantly present in skin is responsible for abscess formation in majority of the instances. Though in initial stages breast abscess can be treated by antibiotics in many instances surgical intervention in the form of either incision and drainage as well as incision, drainage and placement of surgical drain maybe required in many of the patients.Breast abscesses are conventionally classified on the basis of clinical presentation, location and pathogenic organism. Most abscess are result of secondary bacterial infection secondary to spread of infection from adjacent skin. Other than S.Aureus the other common organisms involved in pathogenesis of breast abscess include S.Epidermidis, Streptococci, peptostreptococci and bacteroides.. It must be emphasized that in many cases there are no organisms isolated from culture and sensitivity tests. In these cases, a history of previous antibiotics administration should be sought. In a small number of patients, particularly in immune-compromised individuals, unusual offending organisms such as mycobacterium, parasites or fungi may be involved. Of the common condition puerperal abscesses mastitis is usually seen in primi-gravida women and reported to have an incidence of 2-20% of breast-feeding women. Abscess occurring as a complication of mastitis is reported to occur in 5-10% cases and usually present in first 3 months of postnatal period and is called puerperal abscess. The most common organism involved in these cases is staph. aureus. In initial stages this abscess responds very well to appropriate antibiotics but if management is delayed then surgical intervention becomes necessary. The breast feeding must be continued during the treatment unless the patient is prescribed a drug which makes breast feeding contraindicates such as cephalosporins, tetracyclines or chloramphenicol. The standard management of abscess consist of surgical incision followed by drainage, breaking loculi and insertion of a surgical drain. The management has been evolving and in recent times minimally invasive techniques and percutaneous placement of drain and repeated aspirations of breast abscess is becoming immensely popular among treating surgeons.

This minimally invasive procedure is associated with decreased morbidity and chances of early return to breast feeding. The management of puerperal breast abscess must take into consideration not only the affected mother but also the suckling infants.It is also important while prescribing the drugs to the mother. The antibiotics as well as analgesics given to mothers with puerperal breast abscess should not be able to cross placenta and should be preferably non- sedating in nature so as to not hinder in breast feeding process. Continued breast feeding is one of the important management strategies in cases of breast abscess. Drainage of pus by percutaneous placement of drain under the coverage of antibiotics had been highlighted by many authors in recent times. The main advantage of this approach is that it has cosmetic advantage as well as there is no need of cessation of breast feeding which is required after open incision and drainage. Breast abscesses seen in non-breast-feeding women are called non-puerperal breast abscess. These abscesses are classified as peri areolar (central) and peripheral on the basis of their location. Race (African<Asian<european), increased BMI and smoking are some of the factors associated with increased incidence of non-puerperal breast abscess. They primarily affect young women, most of whom are smokers.[1,4,11] In developed world non-puerperal abscess is seen more frequently as compared to developing world. This may be due to increased prevalence of smoking amongst women in developed world. Central non-puerperal abscess is seen in comparatively young women as compared to peripheral non-puerperal abscess as may be associated with condition associated with decreased immunity such as HIV, diabetes, patients on immunosuppressant and steroids etc... Irrespective of the type, predisposing factors and offending organisms the presenting complaints, work up, imaging studies and management strategy is usually same and consist of antibiotics, analgesics and surgical drainage in selected cases. Non-puerperal breast abscess is more common in central location as compared to peripheral one. Recent surgical interventions are also an important risk factor for occurrence of non-puerperal breast abscess. S.Aureus is found to be one of the most common organisms involved in the formation of this type of breast abscess. Although the other organisms such as anaerobic flora may also be involved. The management of this abscess is also antibiotics and incision and drainage. In the published literature, the incidence ranges from 15%–60% for puerperal abscesses and40%–80% for non-puerperal abscesses. Among the cases of breast abscesses, 50%–90% involve retro areolar region.

II. Methodology

The patients who comes to Aarupadaiveedu medical college with the diagnosis of breast abscess. Based on patient history and clinical examination, the diagnosis of breast abscess will be made. These patients will be worked up to confirm the diagnosis along with preoperative investigations. Patients will be alternately undergoing incision drainage and percutaneous placement of suction drain Each case will be analyzed with reference to postoperative complications like post-operative pain (based on visual analog scale), residual abscess, duration of hospital stay, time required for complete healing and appearance of scar and cost spent for treatment. Each patient will be followed up in the outpatient department at 1 week, 2 weeks and 4 weeks after discharge with regard to wound healing. A minimum of 60 cases with the following inclusion and exclusion criteria will be selected for the study and will be allocated alternatively to each of the comparative study groups. The patients attending outpatient department & admitted to Aarupadaiveedu medical college and hospital, with diagnosis of breast abscess will be taken for this study by period sampling.

Inclusion Criteria

1. Patients with clinical diagnosis of breast abscess.

Exclusion Criteria

1. Patients not willing management
2. Antibioma

Method used:

Under aseptic precautions and with proper informed and written consent procedure was done as follows:

Conventional incision and drainage:drainage is done with intravenous sedation or short general anesthesia by placing corrugated drain and following repeated dressings in post-operative period.

Percutaneous suction drainage: local anesthesia infiltration given below the lower palpable margin of abscess for a small incision with lister sinus forceps all loculi are cleared and complete abscess cavity is irrigated with betadine and hydrogen peroxide. 16F suction drain was inserted to abscess cavity. The perforated portion of drainage tube was shortened to fit in abscess cavity. The drain was fixed to skin with the help of silk 2-0 and suction applied. Pus was sent for culture and sensitivity. Patient was encouraged to breast feed the baby in

nursing women. When pus discharge was diminished to less than 10 ml drain was removed. Further examinations were made at 1 week, 2nd week and 4th week.

III. Observation and results:

Table 1: Age distribution

Age					
Group	N	Mean	Standard Deviation	t-test	p-value
Closed	30	34.100	7.966	1.738	0.088
Open	30	38.100	9.775		

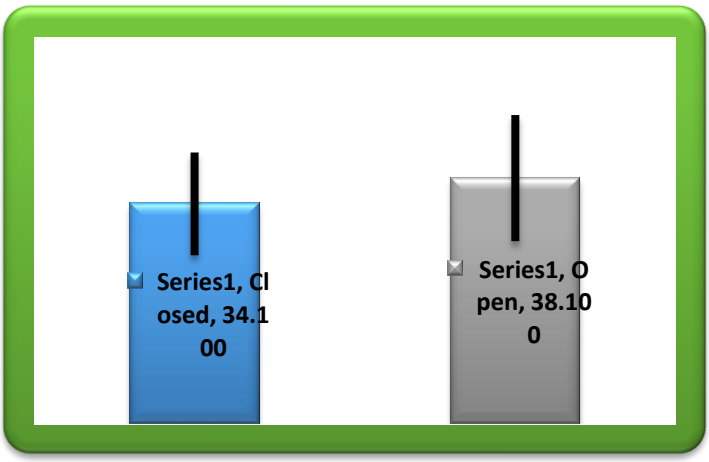

Figure 12: Age distribution

No significance

Table 2: Side of abscess

Side	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
Left	10	33.3%	17	56.7%	27	45.0%	3.300	0.069
Right	20	66.70%	13	43.3%	33	55.0%		
Total	30	100.0%	30	100.0%	60	100%		

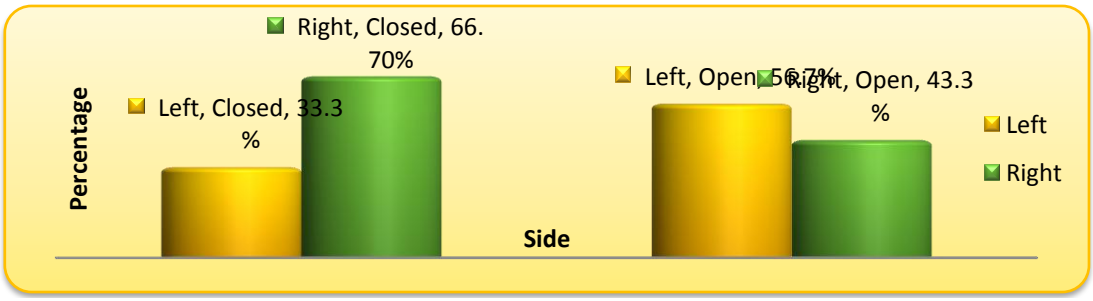

Figure 13: Side of abscess

No significance

Table 3: Appearance of swelling

Swelling	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
No	6	20.0%	0	.0%	6	10.0%	6.667	0.010
Yes	24	80.0%	30	100.0%	54	90.0%		
Total	30	100.0%	30	100.0%	60	100%		

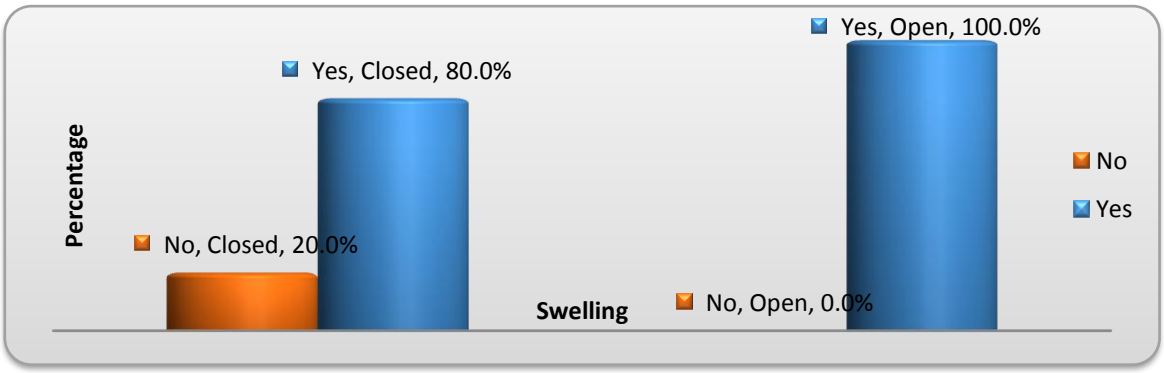

Figure 14: Appearance of swelling

Significance

Table 4: Pain

Pain	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
No	9	30.0%	6	20.0%	15	25.0%	0.800	0.371
Yes	21	70.0%	24	80.0%	45	75.0%		
Total	30	100.0%	30	100.0%	60	100%		

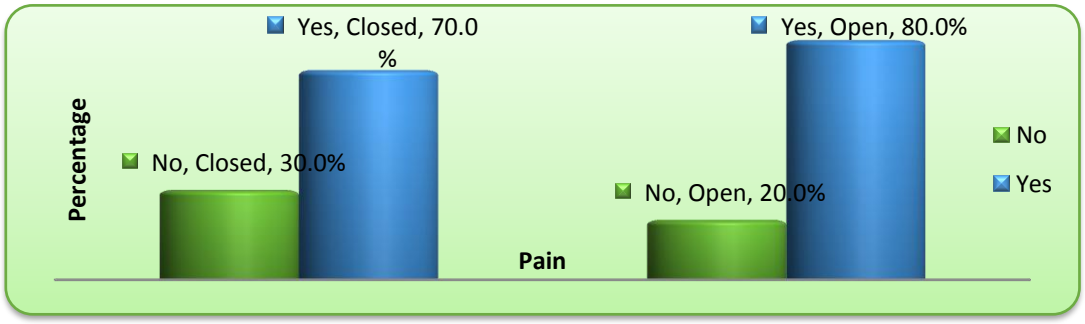

Figure 15: Pain

No significance

Table 5: Post-operative pain

Postop pain	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
No	24	80.0%	12	40.0%	36	60.0%	10.000	0.0010
Yes	6	20.0%	18	60.0%	24	40.0%		
Total	30	100.0%	30	100.0%	60	100%		

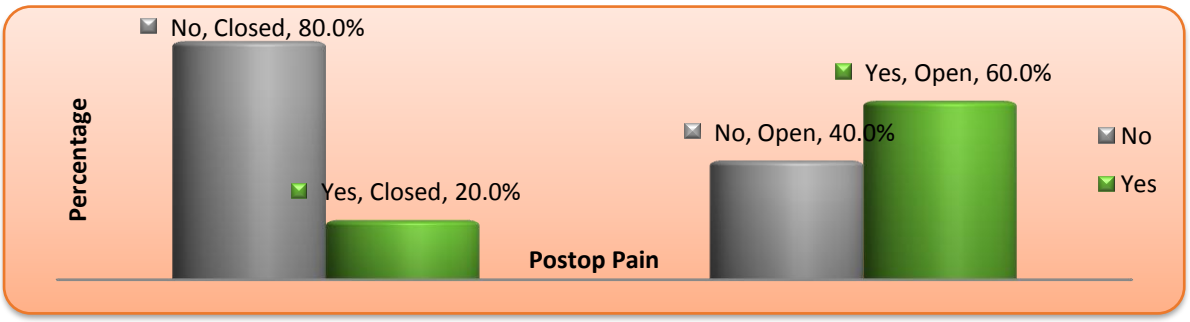

Figure 16: Post operative pain

Significance

Table 6: Residual abscess

Residual	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
No	30	100.0%	18	60.0%	48	80.0%	15.000	<0.001
Yes	0	.0%	12	40.0%	12	20.0%		
Total	30	100.0%	30	100.0%	60	100%		

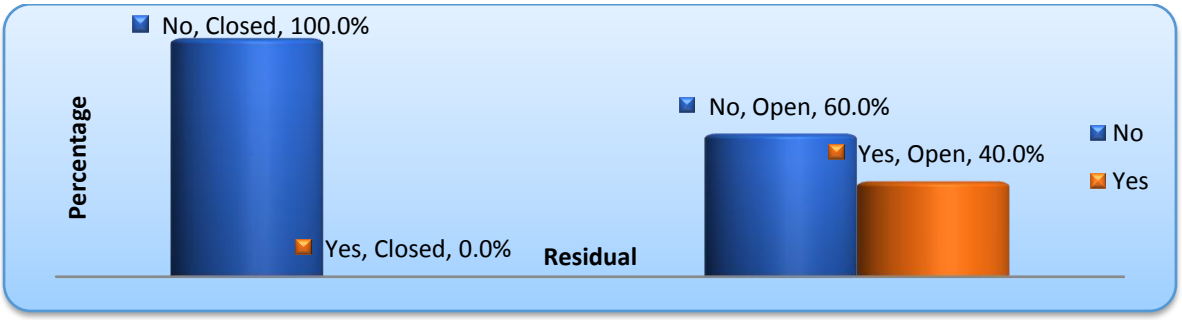

Figure 17: Residual abscess

Significance

Table 7: Scar formation

Scar	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
minimal	30	100.0%	6	20.0%	36	60.0%	40.000	<0.001
maximum	0	.0%	24	80.0%	24	40.0%		
Total	30	100.0%	30	100.0%	60	100%		

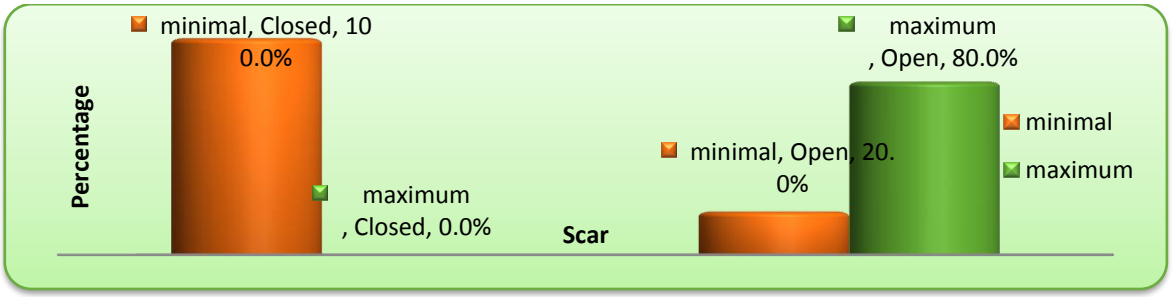

Figure 18: Scar formation

Significance

Table 8: Secondary infection

Sec indection	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
No	30	100.0%	12	40.0%	42	70.0%	25.714	<0.001
Yes	0	.0%	18	60.0%	18	30.0%		
Total	30	100.0%	30	100.0%	60	100%		

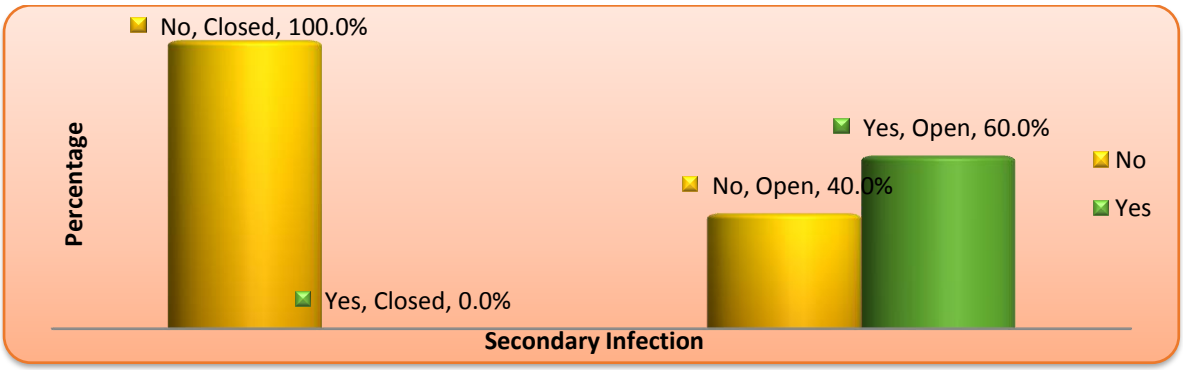

Figure 19: Secondary infection

Significance

Table 9: Hospital Stay

Group	Count	Mean	Median	Percentile 25	Percentile 75	Mean Rank	Mann-Whitney Test	p-value
Closed	30	9.1	8.5	7	12	24.8	279	0.010
Open	30	11.6	12	10	15	36.2		

Table 10: Time for Complete Healing

Group	Count	Mean	Median	Percentile 25	Percentile 75	Mean Rank	Mann-Whitney Test	p-value
Closed	30	10.7	11	9	12	23	225	0.001
Open	30	15.4	15	12	21	38		

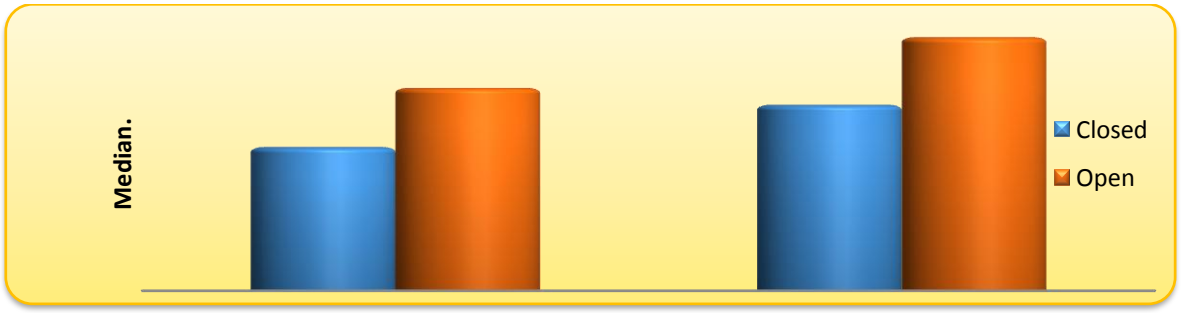

Figure 20: Hospital Stay & Time for Complete Healing

Significance

Table 11: Culture

Culture	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
E.coli	15	50.0%	6	20.0%	21	35.0%	42.857	<0.001
MRSA	0	.0%	18	60.0%	18	30.0%		
Proteus	9	30.0%	0	.0%	9	15.0%		
S.aureus	6	20.0%	0	.0%	6	10.0%		
S.epidermis	0	.0%	6	20.0%	6	10.0%		
Total	30	100.0%	30	100.0%	60	100%		

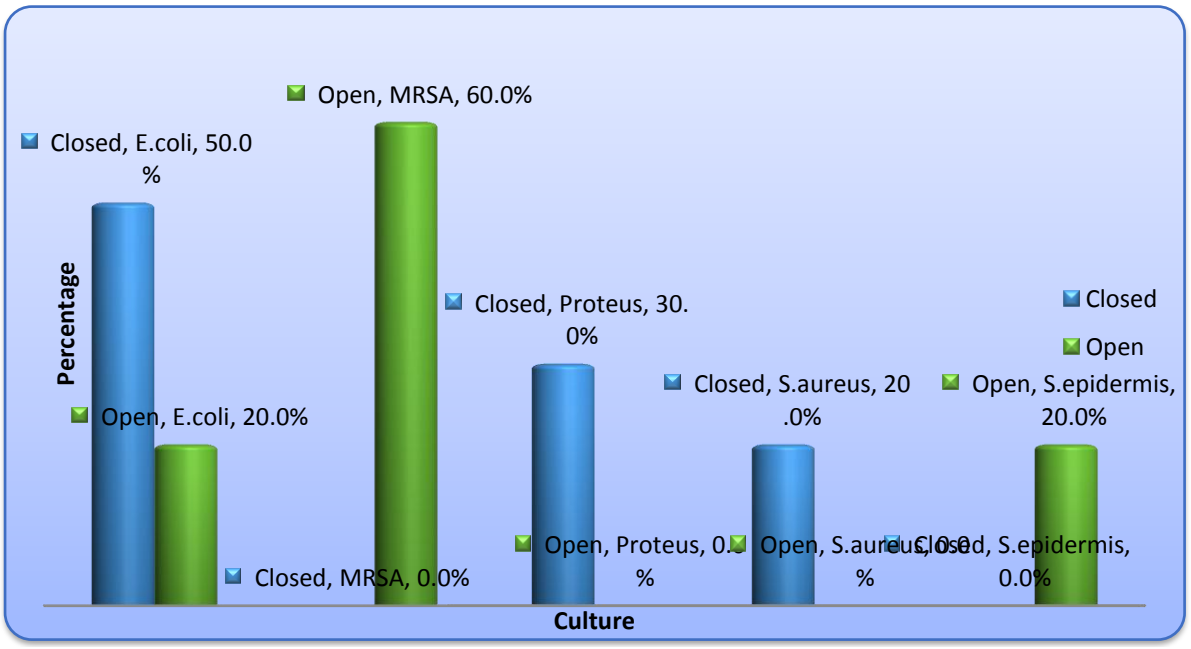

Figure 21: Culture

Significance

Table 12: Follow up

Follow up	Closed		Open		Total		Chi-square test	p-value
	N	Percentage	N	Percentage	N	Percentage		
No	9	30.0%	12	40.0%	21	35.0%	0.659	0.417
Yes	21	70.0%	18	60.0%	39	65.0%		
Total	30	100.0%	30	100.0%	60	100%		

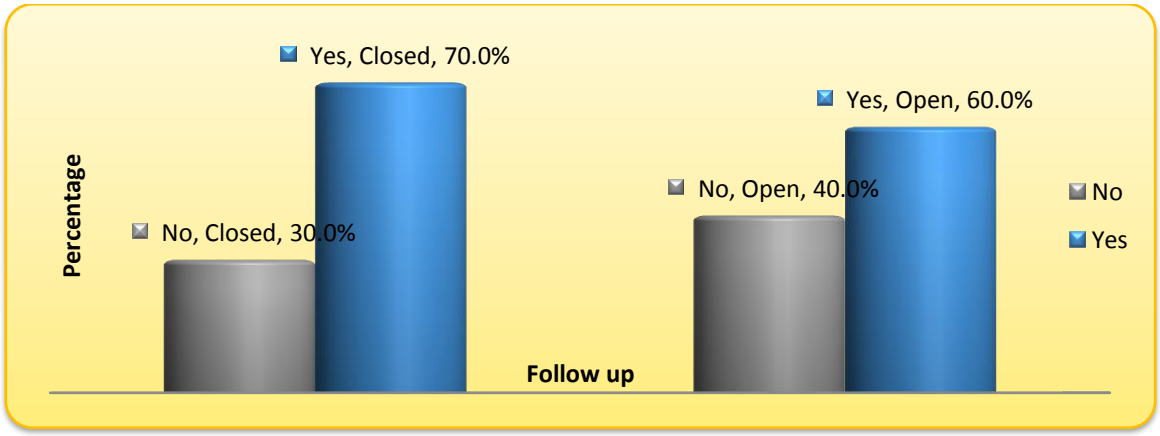

Figure 22: Follow up

No significance

IV. Discussion

In the present study of 60 cases of breast abscess admitted in AarupadaiVeedu Medical College & Hospital were divided and study in 2 groups.Group – I (30 patients) – closed drainage. Group – II (30 patients) – open drainage. A comparative prospective study was designed to compare open and closed drainage in breast abscess and the outcomes in the various modalities for betterment in records to Post-operative pain scar formation,residual abscess,secondary infection.In the study, the least age is 18 years and the maximum are 42 years. The mean age is 34 years in the patient of study groups. The mean age is different in various studies (mean age – 32). Vlitzschetal and AF Christensen et al (mean age – 36) in the study right sided breast abscess is of 55% (33 patients) and left sided breast abscess is of 45% (27 patients). In present study post-operative pain is measured according to visual analogue scale and analgesic requirement. In group I (closed drainage) has reduced post-operative pain (80%) when compared to patient underwent open drainage 40% with significant in P value of less than 0.001. In post-operative period open incision and drainage had more pain dueto repeated dressings and closed drainage were void of it. In our present study closed drainage (Group I) had no residual abscess when compared to open drainage there was 20% residual abscess (12) patients. It is due to continuous negative section created in the walls of abscess cavity that thus not allow residual secretions. With significant p value of 0.001 Khanna et al reported residual abscess in 3% of cases in their study. Chandika et al had no residual abscess in closed drainage but present in conventional incision and drainageKhanna YK et al which show residual abscess in 6% of cases of primary closure and study of Dubey V et al which shows residual abscess in 4.4% of cases of primary closure. In present study no recurrence is seen in group 1 and recurrence rate of 4%in group 2 suggestive of more recurrence in group 2 as compared to group 1. Similar finding was observed in study by Anirrudha K where recurrence was 3 times more in cases of conventional incision and drainage as compared to primary closure. Similar findings were observed in study by Khanna et al. In the study closed drainage group I had better and minimal cosmetics scarring went compared to group II open drainage which had ugly and maximum scarring thesis due to minimal exposure and handling of tissues. According to Chandika et al needle aspiration is highly accepted modality. In the study mean duration of hospital stay and time required for complete healing is of significance > 0.001. Similar finding was observed in a study conducted by Abraham et al. they found that hospitalization was reduced by 40-60% in closed drainage (group I). In the study closed drainage group I had no secondary infection when compare to open drainage Group II which is due to exposure of tissues to external environment. With a secondary infection of 30% in the open drainage with significant P value 0.001 Culture and sensitivity shown E.coli (50%) 15 patients, proteus species (30%) 9 patients and S. aureus (20%) 6 patients in group-1(closed drainage). In open drainage E.coli (20%) 6 patients, MRSA (60%) 18 patients , S.epidermidis (20%) 6 patients. Overall 65% of patients who underwent procedure for breast abscess either closed or open drainage had follow up.

V. Conclusion

In the study of open and closed drainage of breast abscess of 60 patients conducted in AarupadaiVeedu Medical College & Hospital showed most common in age group affected is 21-32 years of age. Right side of affected in 55% of patients. All patients complaint of swelling, pain and all and showed signs of inflammation. Closed drainage is acost-effective alternative method of treatment to incision and drainage in breast abscess patients. Conventional incision and drainage of breast abscess leads to more pain, delayed healing and prolonged cessation of breast feeding. As the condition occurs in young women, scar is a major concern in comparison the approach of closed drainage which leaves behind a better scar, breast feeding is started very early and breast regains it suppleness very fast. Furthermore,post-operative pain, Scar formation, Residual abscess, Secondary infection, time for complete healing and hospital stray is better with closed drainage of breast abscess.

References

[1]. Saleem S, Farooq T, Khan N, Shafiq M, Azeem M, Dab RH. Puerperal breast abscesses; percutaneous ultrasound guided drainage compared with conventional incision and drainage. Professional Medical Journal Dec 2008; 15(4): 431-436.

[2]. Tewari M, Shukla HS. An effective method of drainage of puerperal breast abscess by percutaneous placement of suction drain. Indian Journal of Surgery Dec 2006; 68(6): 330-333.

[3]. Karstrup S, Nolsoe C, Brabrand K, Nielsen KR. Ultrasonically guided percutaneous drainage of breast abscesses. Acta Radiology 1990; 31(2): 157-159.

[4]. Berna JD, Garcia-Medina V, Madrigal M, Guirao J, Llerena J. Percutaneous catheter drainage of breast abscess. European Journal of Radiology 1996; 21: 217-9.

[5]. Harish MSK. The catheter drainage of breast abscesses: is it going to be the future treatment of choice for puerperal breast abscess disease? The Breast Journal Nov. 1997; 3(6): 357-359.

[6]. Pluchinotta AM, Lapponi CA, Basso A, Cavazzini F, Segalina P. Percutaneous pigtail catheter drainage of peripheral non lactational breast abscess. Chir Ital 1998; 50(2-4): 17-19.

[7]. Tan SM, Low SC. Non-operative treatment of breast abscesses. Aust NZJ Surg. Jun 1998; 68(6): 423-424.

[8]. Berna-Serna JD, Madrigal M, Berna-Serna JD. Percutaneous management of breast abscesses. An experience of 39 cases. Ultrasound Med Biol. Jan 2004; 30(1): 1-6.

[9]. Kaplesh J Gajiwala. Puncture, drainage and irrigation: Is that necessary for treating an abscess? Indian journal of plastic surgery Jul-Dec 2006;39(2):189-195.

[10]. Ellis M. Incision and primary suture of abscesses of the anal region. Proc R Soc Med 1960; 53: 652-3.

[11]. Abraham N, Doudle M, Carson P. Open versus closed surgical treatment of abscesses: A controlled clinical trial. Aust N Z J Surg 1997;67:173-6

[12]. Benson EA, Goodman MA. Incision with primary suturing in the treatment of acute puerperal abscess. Br J Surg 1970:57:55-8

[13]. Khanna YK, Khanna A, Singh SP, Laddha BL, Prasad P, Jhanji RN. Primary closure of breast abscess (a study of 50 cases). Indian J Med Sci. 1984 Oct; 38: 197 – 200

[14]. Edino ST, Ihezue CH, Obekpa PO. Outcome of primary closure of incised acute soft-tissue abscesses. Niger Postgrad Med J 2001; 8: 32 -6.

[15]. Ajao OG, Ladipo JK, al-Saigh AA, Malatani T. Primary closure of breast abscess compared with conventional gauze packing and daily dressings. West Afr J Med. 1994 Jan-Mar/13(1):28-30.

[16]. Jones NA, Wilson DH. The treatment of acute abscesses by incision, Primary curettage and primary suture under antibiotic cover. B. J Surg 1976; 63(6): 499-501.

[17]. Kale A, Athavale V, Deshpande N, Nirhale d, Culcuttawala M, Bhatia M. Comparative study of conventional incision and drainage verses incision And drainage and primary closure of wound in acute abscesses. Med J D.Y. Patil Univ. 2014. Vol-7, 744-7.

[18]. Dubey V, Choudhary SK. Incision and drainage versus incision and drainage with primary closure and use of closed suction drain in acute abscesses. Wounds 2013; 25: 58-60.

[19]. Oluwole GA, Adebola OA. Breast Abscess. Journal of national medical association, vol. 71. No. 12, 1979: 11971198. 11. Dener C, Inan A. Breast abscesses in lactating women. World Journal of Surgery 2003: 27: 130 – 1331. Medina D. The mammary gland: a unique organ for the study of development and tumorigenesis. J Mammary Gland Biol Neoplasia. 1996;1(1):5–19.

[20]. Forsyth I A. The mammary gland. Baillieres Clin Endocrinol Metab. 1991;5(4):809–832. [PubMed] [Google Scholar]

[21]. Tobon H, Salazar H. Ultrastructure of the human mammary gland. I. Development of the fetal gland throughout gestation. J Clin Endocrinol Metab. 1974;39(3):443–456. [PubMed] [Google Scholar]

[22]. Sternlicht M D. Key stages in mammary gland development: the cues that regulate ductal branching morphogenesis. Breast Cancer Res. 2006;8(1):201. [PMC free article] [PubMed] [Google Scholar]

[23]. Tiede B, Kang Y. From milk to malignancy: the role of mammary stem cells in development, pregnancy and breast cancer. Cell Res. 2011;21(2):245–257. [PMC free article] [PubMed] [Google Scholar]

[24]. Hughes E SR. The development of the mammary gland. Ann R Coll Surg Eng. 1949;6:99–119.[PMC free article] [PubMed] [Google Scholar]

[25]. Robinson G W, Karpf A B, Kratochwil K. Regulation of mammary gland development by tissue interaction. J Mammary Gland Biol Neoplasia. 1999;4(1):9–19. [PubMed] [Google Scholar]

[26]. Turashvili G BJ, Bouchal J, Burkadze G, Kolar Z. Mammary gland development and cancer. CeskPatol. 2005;41(3):94–101. [PubMed] [Google Scholar]

[27]. Hens J R, Wysolmerski J J. Key stages of mammary gland development: molecular mechanisms involved in the formation of the embryonic mammary gland. Breast Cancer Res. 2005;7(5):220–224.[PMC free article] [PubMed] [Google Scholar]

[28]. Robinson G W, Karpf A B, Kratochwil K. Regulation of mammary gland development by tissue interaction. J Mammary Gland Biol Neoplasia. 1999;4(1):9–19. [PubMed] [Google Scholar]

[29]. Plante I SM. L.D., Evaluation of mammary gland development and function in mouse models. J Vis Exp. 2011;21:2828. [PMC free article] [PubMed] [Google Scholar]

[30]. Sakakura T. New York: Plenum Press; 1987. Mammary embryogenesis; pp. 37–66. [Google Scholar]

[31]. Howard B A, Gusterson B A. Human breast development. J Mammary Gland Biol Neoplasia. 2000;5(2):119–137. [PubMed] [Google Scholar]