Drains in Breast Cancer Surgery – To Use or Not to Use?

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Breast cancer is and has been the most common cancer in women since 1997 and its incidence is increasing. In the UK, in 2009 alone, there were 48,417 new cases of breast cancer in women[1].

One of the most effective treatments for breast cancer is surgery. The aim of surgery is to remove cancer cells locally, prevent any spread of the cancer and to reduce the recurrence of cancer in the breast. This in turn, reduces the psychological impact on the patient and helps the patient to return back to her routine life as soon as possible. However, undergoing breast surgery for cancer- whether a wide local excision or a mastectomy (with or without axillary node dissection) – is in itself a daunting and frightening procedure for the patient. Therefore all must be done to ensure complications are minimised so as to not prolong the patient's hospital stay and distress, increase the hospital's financial burden, or delay any subsequent adjuvant therapy[2].

Wound infections, seromas and hematomas are the most frequently observed complications of breast surgery. A study by Vinton et al reported a wound complication rate of 35% after wide local excision and axillary node dissection and 49% after modified radical mastectomy, with the most common complication being seroma formation[3]. Although seromas are not life threatening, they can lead to significant morbidity such as flap necrosis, wound dehiscence, sepsis, impaired shoulder mobility and may delay adjuvant therapy (chemotherapy or radiotherapy). Consequently, this will prolong a patient's recovery period and lead to multiple hospital visits [4].

Closed suction drainage systems are believed to prevent the accumulation of blood, lymphatic fluid and pus, post-breast surgery (Figure 1). In turn this can then go on to prevent a haematoma, seroma or infection respectively. In a study carried out by Summers et al it was concluded that those who received the closed suction drainage had a reduced frequency of seroma formation (2.2 +/- 2.2 versus 3.3 +/- 2.1; p less than or equal to 0.002), a reduced volume of postoperative aspirations (146.3 +/- 181.1 mL versus 266.1 +/- 247.6 mL) and a shorter time to seroma resolution (11.5 +/- 10 days versus 18 +/- 10.1 days; p less than or equal to 0.0002) in comparison to those who did not receive a drain [5].

A systematic review of randomised controlled trials also demonstrated that suction drainage after axillary lymph node dissection significantly reduced the volume and frequency of aspirations without increasing the incidence of wound infection [6].

However the benefits of a drainage system are not without controversy, with some questioning the benefits of such a system.

Firstly, with any foreign material entering the body there is a risk of infection. A meta-analysis by Xue et al found that post-operative drains were one of the significant risk factors for surgical site infections after breast surgery[7]. Secondly, drains are also uncomfortable for the patient. A study by Jain et al found that patients without post-operative drains had less discomfort than those with drains [8].

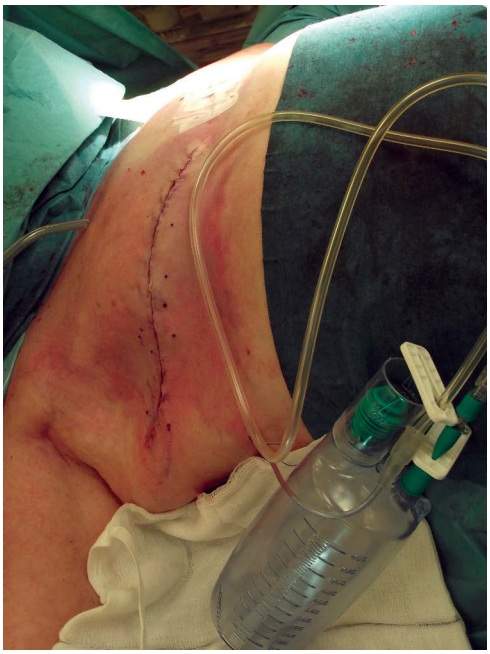

Figure 1: Closed suction drainage system insitu post-mastectomy.

Arguably the main problem with the insertion of drains is that it lengthens hospital stay for the patient due to the need for wound and drain care by breast nurse specialists. There are many reasons why a longer hospital stay is undesirable, these include preventing patients getting back to their home environment, routine and life disturbance, occupying hospital in-patient resources and prolonging patient anxiety. For these reasons there is a current national move towards a 23-hour ambulatory (day) surgery, supported by the 'NHS transforming in patient care programme.'

The movement in the NHS is towards implementing the best practice tariff which at the same time does not jeopardise the quality of care. In the case of breast surgery, day case surgeries and the adaptation of a no drain practice are clear results of such a movement.

Some may argue that day surgery and the use of drains are not incompatible as a patient could go home with their drain in situ. However, this does not eliminate the other problems that the drains carry (discomfort, disconnection, cost, infections and inconvenience) and may even exacerbate them as a reaction of the body against any foreign material. A study by Andrade et al found the incidence of surgical site infections among women who were routinely discharged with a drain in place to be as

high as 17% [9]. Also if patients are to be discharged early with drains, there are hidden costs such as extra nurse visits or daily telephone contacts with nurse specialists which must also be considered [10]. There is also a possible positive psychological impact associated with surgery without the use of a drain, as patients may feel more ready to be discharged back to their home environment.

Various other techniques are under research in attempt to reduce complications of breast surgery. A study by Classe et al found axillary padding to be safe and feasible after axillary lymphadenectomy for breast cancer. It concluded very similar rates of post operative complications but significantly reduced the mean postoperative hospital stay (1.8 versus 4.5 days, $P < 0.001$) in comparison to a closed suction drainage system [11].

Jain et al found that the application of fibrin sealant glue, after mastectomy, reduced seroma formation (8 out of 19, 42% versus 10 out of 12, 86%. $P = 0.048$) and volume of aspirate (190mL versus 395mL. $P = 0.012$) compared to those with no intervention. Although there was no significant difference found in seroma formation between the use of fibrin sealant glue and drains, there was an increased pain score and hospital stay duration in patients who had drains compared to those with only fibrin sealant glue [12].

In conclusion it is evident that breast surgery has complications, in particular seroma formation, which need to be addressed and prevented. There is evidence that closed suction drainage reduces the incidence of seroma formation, nevertheless its benefits have not been proven to outweigh the risks and therefore its use in breast surgery is decreasing. Evidently the problems of seromas still remain; however there are numerous studies being carried out aimed at their prevention. Methods such as axillary padding and fibrin sealant glue are examples of promising research done in this area. With further research, we hope these methods can change surgical practice for the better.

References

1. http://www.cancerscreening.nhs.uk/breastscreen/breastcancer.html
2. El-Tamer MB, Ward BM, Schifftner T, Neumayer L, Khuri S, Henderson W. *Morbidity and Mortality Following Breast Cancer Surgery in Women. Annals of Surgery.* 2007;245(5):665-71.
3. Vinton AL, Traverse LW, Jolly PC. *Wound complications after modified radical mastectomy compared with tylectomy with axillary lymph node dissection.* The American Journal of Surgery. 1991;161(5):584–8.
4. Bosman J, Piller N. *Lymph taping and seroma formation post breast cancer.* Journal of Lymphoedema, 2010;5(2).
5. Somers RG, Jablon LK, Kaplan, MJ, Sandler GL, Rosenblatt NK. *The use of closed suction drainage after lumpectomy and axillary node dissection forbreast cancer. A prospective randomized trial.* Ann Surg. 1992;Feb;215(2):146-9.
6. He XD, Guo ZH, Tian JH, Yang KH, Xie XD. *Whether drainage should be used after surgery for breast cancer? A systematic review of randomized controlled trials.* Lanzhou University, China.
7. Xue DQ, Qian C, Yang L, Wang XF. *Risk factors for surgical site infections after breast surgery: A systematic review and meta-analysis.* European Journal of Surgical Oncology. 2012;38(5):375-81.
8. Jain PK, Sowdi R, Anderson ADG, MacFie J. *Randomized clinical trial investigating the use of drains and fibrin sealant following surgery for breast cancer.* Article first published online: 29 DEC 2003 DOI:10.1002/bjs.4435. Published: by John Wiley & Sons, Ltd. British Journal of Surgery, 2004;91(1):54–60.
9. Andrade W, Felippe B, Loureiro G, Guilherme W, Lopes S. *Surgical site infection among women discharged with a drain insitu after breast cancer surgery.* Online: worldjsurg 31, 5th Oct 2007.
10. Classe JM, Bercherry D, Campion L, Pioud R, Dravet F, Robard S. *Randomized clinical trial comparing axillary padding with closed suction drainage for the axillary wound after lymphadenectomy for breast cancer.* British Journal of Surgery. 2006;93(7):820-4.
11. Classe JM, Bercherry D, Campion L, Pioud R, Dravet F, Robard S. *Randomized clinical trial comparing axillary padding with closed suction drainage for the axillary wound after lymphadenectomy for breast cancer.* British Journal of Surgery 2006;93(7):820-4.
12. Jain PK, Sowdi R, Anderson ADG, MacFie J. *Randomized clinical trial investigating the use of drains and fibrin sealant following surgery for breast cancer.* Article first published online: 29 DEC 2003 DOI:10.1002/bjs.4435. Published: by John Wiley & Sons, Ltd. British Journal of Surgery. 2004;91(1):54-60.