Improving patient outcomes: decorative tattoos, breast cancer and lymphoedema

KEY WORDS
- Breast cancer
- Breast cancer-related lymphoedema
- Decorative tattoo
- Lymphoedema
- Mastectomy tattoo

Background: Breast cancer-related lymphoedema (BCRL) is a chronic complication following breast cancer treatment, and is associated with adverse physical and psychological outcomes. Decorative tattoos have become tremendously popular in recent years among breast cancer survivors, with emotive images flooding online search engines and social media channels. However, a possible clinical practice issue is highlighted, with the use of tattoos within the at-risk area causing skin damage that could potentially cause, or exacerbate, lymphoedema symptoms. **Aims:** A literature review was conducted to establish what is known about tattooing in the context of BCRL. **Methods:** The sources consulted in reviewing the literature included CINAHL, Health Source and MEDLINE via EBSCO host, PubMed and Cochrane Database of Systematic Reviews from 2006–2017. A web-based search was also conducted to ensure inclusion of relevant documents not listed in the above-mentioned databases. **Results:** It was found that tattoos and BCRL are not discussed in current literature, nor does expert consensus exist to specifically address this practice. **Conclusion:** The importance of understanding the risk profile of decorative, non-clinical tattoos for those at risk of developing lymphoedema is emphasised. It is hoped that this literature review will prompt further discussion and facilitate studies to guide information provision and expert consensus, in order to optimise long-term outcomes in the context of breast cancer rehabilitation.

BCRL is a much-feared, chronic complication following breast cancer treatment and is characterised by the accumulation of protein-rich fluid in the arm, breast and/or trunk (Specht et al, 2013). While the true risk factor profile remains unknown, the International Lymphoedema Framework (ILF, 2006) provides a comprehensive list of factors that may increase lymphoedema risk including axillary dissection and/or extensive breast surgery, radiotherapy, post-operative complications such as infection and trauma to the at-risk arm. Additional precipitating factors discussed in the literature include obesity and systemic therapies such as taxane-based chemotherapy regimens (McLaughlin et al, 2017a). A number of traditional risk-reducing behaviours, such as the prophylactic use of compression garments during air travel, and the avoidance of venepuncture and blood pressure monitoring on the affected arm, remain unsupported in current literature (McLaughlin et al, 2017b). Recent expert consensus instead favours the application of personalised risk-reduction strategies opposed to blanket recommendations (McLaughlin et al, 2017b). Exercise, maintenance of an optimal body weight and the critical importance of skin care have largely been accepted in consensus documents as 'common sense' risk-reduction strategies, with 'protect skin from injury' and 'avoid injections' being among the list of recommendations (Poage et al, 2008).

TATTOOING

Decorative tattoos have become tremendously

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Figure 1. Decorative tattoos have become very popular among breast cancer survivors

popular among breast cancer survivors, with emotive images flooding online search engines and social media channels *(Figure 1)*. Tattooing involves the introduction of exogenous pigments and dyes into the dermis to obtain a permanent design (Kluger, 2016a). An acute aseptic inflammatory reaction occurs in all individuals irrespective of the size of the tattoo and/or length of session(s), including erythema, oedema and pain. Healing is reported to take two to three weeks, with superficial crusting of the skin falling away to reveal the ink retained within the epidermis (Kluger, 2016a). Complications may occur, however, the frequency is difficult to accurately determine in current literature as data have mostly been collected from self-reports and questionnaires (Kluger, 2016a). Risks discussed in the literature include infection, hypersensitivity reactions, extra-cutaneous complications and malignancies arising from the tattoo itself (Kazandjieva and Tsankov, 2007; Kluger, 2012; Kluger and Koljonen, 2012). Additional risks include the varied manufacturing, composition and regulation of tattoo inks, with a number of hazardous chemicals being identified within tattoo inks on the European market (Piccinini et al, 2016). Chronic enlargement of regional lymph nodes due to the migration and deposition of tattoo pigments may also occur, resulting in abnormal appearing lymph nodes during imaging (PET, CT, mammography) and surgery (Kluger, 2016a), in addition to life-long exposure to potentially toxic elements; the effects of which are currently not well understood (Schreiver et al, 2017).

A potential clinical practice issue is highlighted, with the use of tattoos in the at-risk quadrant causing deliberate skin damage that could potentially cause, or exacerbate, lymphoedema symptoms in those who are at risk for developing BCRL. Another practical point is that during sentinel lymph-node biopsy, unnecessary excisions of lymph nodes containing tattoo-ink could increase the risk of lymphoedema (Soren A et al, 2017). A literature review was therefore conducted to establish whether a relationship exists between decorative tattoos and BCRL.

METHODS

The sources consulted in reviewing the literature included CINAHL, Health Source and MEDLINE via EBSCO host, PubMed and Cochrane Database of Systematic Reviews from 2006–2017. A web-based search was also conducted to ensure inclusion of relevant documents not listed in the above-mentioned databases. General key words included "tattoo or tattoos or tattooing or body art" and "breast cancer". These were then combined with additional search terms including "lymphoedema or lymphedema or BCRL". Articles were hand sorted by title and abstract for relevance and therefore inclusion. Reference lists of obtained articles were additionally hand searched in order to identify additional literature not captured in the initial search strategy.

SEARCH RESULTS

Using the above search strategy, 169 abstracts were reviewed for this study. Two articles specifically discussed the role of decorative tattoos in the context of breast cancer, and the possible motivators for obtaining them. No studies directly examined the relationship between decorative tattoos and BCRL.

DISCUSSION

While no literature linking tattoos and BCRL were identified, two editorial articles specifically discussed decorative tattoos following breast cancer surgery.

Kluger (2016b) noted the acceptance of tattoos within the current societal landscape and discusses their role following mastectomy including nipple-areola reconstruction, scar coverage and decorative adornment. It is suggested that while serving a beautification function for the patient, the tattoo may additionally serve as a coping strategy and way to reclaim control of the body part that had previously confounded them. Kluger suggested that the risks associated with decorative tattooing in the context of breast cancer are the same as the general population, and any others discussed are likely to be theoretical given the newness of this practice and lack of available literature. Risks discussed

include the issue of possible carcinogens in tattoo inks, and the potential for systemic absorption of tattoo compounds if failed to be stopped by regional lymph nodes, such as in the case of axillary dissection. The editorial considered these theoretical risks to be minimal in the absence of definitive evidence when compared with the apparent patient benefits, including improved self-esteem and psychological wellness (Kluger 2016b).

Allen (2017) provided insight from the perspective of the tattoo artist, including the comprehensive screening process conducted in order to establish the appropriateness of a post-mastectomy tattoo based on the client's history, psychological wellbeing, motivators and expectations. Communication with relevant healthcare professionals, including oncologists and plastic surgeons, is discussed in relation to optimising safety and excluding contraindications, as well as assisting with the planning of tattoo designs based on past and/or future treatment. Allen (2017) discussed the differences between traditional tattooing and that which is required following cancer treatment. A thoughtful, gentle, skilled technique is described, with particular focus on efficiency and limited trauma. The need for genuine thought and empathy is emphasized. Allen further noted a general lack of complications, aside from the natural degrading process of the ink, which may require return visits for touch-ups. While this anecdotal commentary is beneficial, Allen's experience as a tattoo artist, as opposed to medical professional, is noted. The healing role of mastectomy tattoos is emphasized, with the author noting that a successful tattooing experience has the potential to establish a new point of reference for the patient; replacing rupture and damage with an act of creation that is intimately theirs (Allen, 2017).

Given the obvious gap in current literature, urgent studies are needed to establish the relationship between decorative tattoos and lymphoedema for the at-risk patient following breast cancer treatment in order to inform best practice. The environment, expertise of the tattoo artist or clinician, tattoo complexity and duration may all warrant investigation as to its influence on lymphoedema risk. Studies investigating the long-term systemic effects of decorative tattooing after breast cancer treatment may also be warranted, including the effect of regional lymph node staining on cancer surveillance and staging. The relationship between decorative tattoos and psychological wellness in the context of survivorship would also be beneficial. Researchers may additionally consider investigating clinical tattoos (radiotherapy field markings and nipple-areola tattoos) and their influence on lymphoedema risk given that no literature currently exists to demonstrate this relationship.

CONCLUSION

BCRL is a chronic complication following breast cancer treatment and has been shown to have a significant impact on both physical and emotional wellbeing. The fundamental importance of understanding the risk profile associated with decorative tattoos for those at risk of developing lymphoedema is emphasised, in order to prevent complications that would almost certainly contradict the initial reason for obtaining them. Future research is required to establish the relationship between this emerging practice and BCRL. The author additionally calls for greater collaboration between health professionals and the tattoo industry, in order to optimise long-term outcomes in the context of BCRL risk reduction and survivorship. WUK

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