Boffin Access

Open Access Journal | Volume: 1.2

International Journal of Surgical Procedures

ISSN 2517-7354

Cost Effective Translational Imaging in Breast Cancer Management

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Editorial

Breast cancer is most frequently diagnosed cancer and leading cause of cancer related deaths in females. It has a varied behavior and biology responsible for its various clinical presentations and treatment outcome [1]. This necessitated the need for exhaustive study of tumor biology and Pathology which have significant reflection in the comprehensive evaluation and management. The different clinical presentations are early, locally advanced, recurrent and metastatic breast cancer. There had been lots of concern in comprehensive management of the disease and exponential growth in various diagnostic and therapeutic modalities. These concerns are early detection, lymph node mapping, detection of metastatic and recurrent lesions, tumor biology and pathology, various modalities of treatment including targeted therapy and disease free survival. One of the modalities which have been translated to overcome the concerns is imaging techniques. The imaging modalities described are mammogram, computed tomography, radioisotope imaging, color Doppler ultrasound, magnetic resonance imaging, magnetic resonance spectroscopy, single photon emission computed tomography, positron emission tomography, optical imaging including optical computed tomography and near infrared imaging florescence [2]. Several of these imaging modalities have been used for preclinical research, part of technological development and certainly for clinical studies. The fact remains that which of these modalities can be extensively and optimally used in clinical practice in a cost effective manner and with minimal limitations. Cost effectiveness is another major concern globally in the management of the cancer. Further the imaging being used should be sensitive and specific. Many of these imaging have limitations and are being exploited for clinical research. The modalities used in clinical scenario also have limitations and are at times complimentary to each other.

The imaging modalities are being used for screening and localization of early lesions (Mammography and MRI), for evaluation of early or advanced mass lesions (ultrasonography, magnetic resonance imaging and magnetic resonance spectroscopy), for staging and evaluation of advanced and recurrent lesions (FDG PET), for response evaluation following neo-adjuvant therapy (Doppler ultrasound, magnetic resonance imaging, magnetic resonance spectroscopy and positron emission tomography, for evaluation of nodes (Radioscintigraphy). Currently the optical imaging/optical spectroscopy are in vogue for response assessment through measurement of optical indices [2]. The parameters being evaluated are anatomical and biochemical. The gold standard parameter has been histological and the imaging has been exploited for predicting the response assessment of histological response as well. There are studies which were well undertaken and concluded that the serial Doppler ultrasound evaluation of tumor is concordant with the histological response of the tumor following neo-adjuvant chemotherapy [3]. The other methods adopted are not cost effective and lead to radiation exposure. The serial Doppler evaluates the various Doppler indices and are resistivity index, pulsatality index and peak flow velocity. The method is quite practical, portable, cost effective and safe. This modality presumably could be exploited for evaluation of response following any systemic modality of treatment and needs to be supported by multicenter trials.

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Article Information

DOI: 10.31021/ijsp.20181109
Article Type: Editorial
Journal Type: Open Access
Volume: 1 **Issue:** 2
Manuscript ID: IJSP-1-109
Publisher: Boffin Access Limited

Received Date: 15 May 2018
Accepted Date: 26 May 2018
Published Date: 28 May 2018

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Citation: Kumar A, Cost Effective Translational Imaging in Breast Cancer Management. Int J Surg Proced. 2018 May;1(2):109

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