Multidisciplinary team approach in breast cancer care: Benefits and challenges

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ABSTRACT

The multidisciplinary team approach has been employed internationally for decades, as an attempt to bring collaborative decision-making and concentrate clinical experience from multiple specialties on single patient cases in a systematic fashion. Adoption is not yet worldwide, but is increasing. The role of the histopathologist is central, providing vital information and context to clinical diagnosis and management. Our review summarizes some of the most relevant research on the topic of MDT usage and efficacy in relation to breast cancer, attempting to draw together its advantages and challenges. It is hoped that this review will make a contribution to the current international literature regarding multidisciplinary approaches in breast cancer care.

KEY WORDS: Breast cancer, histopathology, MDT, Multidisciplinary team meetings, multidisciplinary

INTRODUCTION

Multidisciplinary team meetings (MDTM), (also known internationally as ‘tumor boards’/‘multidisciplinary cancer conferences’) consist of multiple medical and allied professionals from different specialties, who come together to discuss a list of assigned patients[1] and create a well-informed, concordant diagnosis and treatment plan. In the context of breast cancer, this will include such members as an oncologist, radiologist, histopathologist, surgeon, specialist nurse, allied health professionals and an administrator. While this review is slanted towards a breast cancer setting, the role of the MDTM is fundamental and applicable to all cancer specialties across all countries. The MDTM model is also increasingly being used in delivery of certain non-cancer specialties such as inflammatory bowel disease. The literature in this area is highly heterogeneous, with varying definitions and few definitive statements on outcomes of multidisciplinary care. This narrative review attempts to outline the purpose, history, advantages, and challenges of the multidisciplinary team approach, and suggest their relevance to the role of professional histopathologists.

METHOD

A qualitative/quantitative study search was conducted on the subject of multidisciplinary care, selecting for 21st century (2001-2019) studies in several electronic databases (MEDLINE, HDAS/PubMED) Information and data was drawn together in a descriptive fashion after extraction.
Due to wide variation in quality and clinical practice in cancer care in the early 1990s in the United Kingdom (UK), the Calman-Hine report was commissioned, with an intention of providing “a strategic framework to help commissioners and providers of cancer services to make well-informed and wise decisions”.[8]

This MDTM approach was quickly adopted in other nations. In the United States (US), hospital 'tumor boards' meet in many tertiary care centres to review patient cancer cases, assign diagnoses and decide programs of care. Their approach varies from centre to centre, but in the majority of studies reviewed, an attending-physician-level surgeon, pathologist, radiologist and oncologist were involved, with variable involvement of specialist nurses, allied health professionals, patient representatives, and in rare cases, the patient themselves.

In the UK, this approach has been in widespread use for some time, as discussed earlier; multidisciplinary team working in cancer was deemed “essential” by the Expert Advisory Group on Cancer in their 1996 recommendations to the Chief Medical Officers of England and Wales.[3] and NHS (public) hospitals have universally adopted this approach.

MDT approaches are increasingly being implemented in the Middle East,[6,7] South America, and most crucially to our review, South Asian nations like India.[8]

WHAT HAPPENS AT AN MDT MEETING?

A room is prepared, separate from the clinical environment, and suitably equipped to accommodate the full team. This usually includes staffed computer equipment to track patient details, provide appropriate pacing to the meeting, and provide information as needed. A video projector on hand to display images for analysis is very useful, allowing real-time consideration of the case from all perspectives. Video-link technology may be employed to facilitate virtual attendance of team members who are unable to attend.[9]

An MDT list of patients will be sent to all concerned clinical parties, preferably around 24 hours beforehand to allow sufficient preparation. A histopathologist, for instance, will need to print off their reports, read them and check for discrepancies, retrieve slides for review and discuss with the reporting pathologist if queries/disputes are raised. He/she will need to present cases clearly and concisely, including all information required for clinical management.

The ‘triple-assessment’ approach will be employed, optimally with a consultant radiologist, consultant breast surgeon and consultant histopathologist, to seek a diagnosis and optimize a treatment plans, with the aim of concordance across all specialties where possible. (As discussed later, cases with high concordance also score well for diagnostic accuracy, and ultimately patient outcome. By these means, a robust MDT meeting following established procedures ensures patient safety). Naturally, the radiologist will be called upon to provide her/his expertise on the clinical interpretation of images; the surgeon on the extent of the growth, resectability/operability of masses/tumors, and the oncologist on potential treatment pathways. Creating a synthesis of these disparate viewpoints, an ideal outcome is for a concordant conclusion to be reached as to the patient diagnosis and a plan outlined on disease management.

HOW IS THIS APPROACH CURRENTLY APPLIED IN INDIA?

There are several criteria that have been proposed for a healthcare facility (or a part thereof) in India to be designated a ‘cancer center’. These include:

- Primary and secondary prevention of cancer (e.g., through education/increasing awareness/local area population screening).
- Incorporating rural population centres into their coverage area to assist people who are geographically or economically disadvantaged.
- Unified guidelines and treatment protocols for cancer management. Transparency/accountability/good governance.

**Multidisciplinary care**

This last point is central to our review. Though financial, cultural, educational or logistical barriers may exist to forming MDTs in India in some secondary care centres (for instance, lack of personnel), some researchers recommend that all newly diagnosed patients with cancer be discussed by an MDT/tumor board, with a full range of specialized clinicians.[4] Due to geographic/logistical constraints in more rural areas, such a range of personnel may not be available, but video-link interface may partially ameliorate this problem.[6]

With 25 Regional Cancer Centres (RCCs) operating in India today (National Cancer Control Program, 2014), and many hospitals offering oncological services to an enormous local population, the work involved in improving cancer care is considerable. The Department of Health, under the portfolio of the Ministry of Health and Family Welfare, oversees this process.
In any given year, around 12.5 lakh new cases are diagnosed. The yearly mortality is around 6.8 lakh patients.\(^\text{[10]}\)

The National Cancer Control Program (NCCP), initiated in 1975, and modified for emphasis on preventative cancer care in 1984, has been largely successful in its aims.\(^\text{[11]}\) NCCP supports around thirty tertiary cancer centres, and nearly a hundred oncological wings in medical colleges across the country. The establishment/support of new TCCs and supporting existing RCCs are other aims of the NCCP, under the newly established National Program for Prevention and Control of Cancer/Diabetes/Cardiovascular Disease/Stroke (NPCDCS).

Despite recent leaps forward in cancer care, India continues to advance rapidly in its approach to diagnosing, treating and registering patients with cancer. The National Centre for Disease Informatics and Research (NCDIR) continues to develop their national research database, facilitating the development of clinical studies, research and epidemiological studies. Cancer registries and POCSS (Patterns of Care and Survival Studies) are examples of new areas of development under the NCDIR. New data on breast cancer (among other cancer subtypes) is constantly under analysis for publication. In relevance to histopathology, new software modules have been developed for the documentation and registration of pathological details.\(^\text{[12]}\) The Cancer Atlas project, providing useful data on case incidence in outlying areas, was one example of new approaches in epidemiological analysis of cancer cases, additionally providing epidemiological and registration training for pathologists.

In relevance to new treatments (advanced-level radiotherapy/tomotherapy/gamma knife/brachytherapy), the recently-proposed National Cancer Institute (NCI) at the Jhajjar-based All India Institute of Medical Sciences (AIIMS) has ambitious aims in terms of filling gaps in treatment and providing advanced care for large numbers of patients.

Histopathologists with a breast specialization will already be well aware that breast cancer constitutes the largest portion of new incidences of cancers in women, according to the National Cancer Registry Programme (NCRP) data collected by the Indian Council of Medical Research (ICMR). This is particularly true in the Mumbai/Delhi urban registries, and it closely rivals cervical cancer for prevalence in the Barshi/Aizwal registries. As Indian cancer care continues to advance, adopting a widespread MDT approach in well-funded regional centres initially may augment and increase the number of patients being correctly diagnosed and treated by a wide panel of experts, rather than an isolated physician.

**ADVANTAGES OF THE MDT APPROACH**

The advantages are manifold: when patient information is scrutinized by multiple professionals with different fields of knowledge and experience, accuracy in diagnosis is higher and patient outcomes are improved, both specifically in the area of breast cancer and elsewhere.\(^\text{[4,13‑16]}\) Through face-to-face communication, discussion and debate over aspects of care, the clinical team grows closer and more cohesive than its individual members would in isolation. For these reasons and for many others, medical authorities in several nations consider MDT care to be the “gold standard” in cancer treatment,\(^\text{[17]}\) and it is in wide adoption internationally.\(^\text{[18]}\)

Standardized approaches in MDT cancer care are essential to create a common framework, which all team members can use. This is underpinned by national standards and guidelines for reporting of non-operative (biopsies/cytology) and operative specimens for pathologists.

For instance, in the United Kingdom, such reporting guidelines are written and defined by the Royal College of Pathologists, with consultation from a wide spectrum of histopathologists eminent in their field, on a three-yearly revision cycle. One of the authors of this article has also been a co-author in both key datasets related to pathological reporting of non-operative and surgical specimens, namely, “Guidelines for non-operative diagnostic procedures and reporting in breast cancer screening” and “Pathology reporting of breast disease in surgical excision specimens incorporating the dataset for histological reporting of breast cancer.”

The purpose of such datasets is explained thus by the Royal College of Pathology:

> "The cancer datasets published by The Royal College of Pathologists (RCPath) are a combination of textual guidance, educational information and reporting pro formas. The datasets enable pathologists to grade and stage cancers in an accurate, consistent manner in compliance with international standards and provide prognostic information thereby allowing clinicians to provide a high standard of care for patients and appropriate management for specific clinical circumstances."\(^\text{[19]}\)

Similar documents are published by other professional colleges of pathology worldwide, such as the Royal College of Pathologists of Australasia’s Cancer Reporting Guidelines, resulting from their National Structured Pathology Reporting of Cancer project.\(^\text{[20]}\) The College of American Pathologists also provide tissue reporting guidelines under their Cancer Recording Protocols and associated documents, to “provide guidelines for collecting the essential data elements for complete reporting of malignant tumors and optimal patient care.”\(^\text{[21]}\)

All needle core breast biopsies are reported using a standardized B1-B5 approach (with B1 representing normal/no clinical suspicion and rising numbers representing a steady increase in perceived pathology from slide review and histological examination). A C1-C5 approach works similarly for reporting of Fine Needle Aspiration Cytology (FNAC) specimens.

Of course, with the infinite ambiguities and uncertainties of pathological diagnosis, terms such as ‘normal’, ‘benign’,
‘suspicious’ may appear unhelpful on first sight, especially to non-pathologists. Let us examine what such terms mean.

B1: ‘normal’: normal breast tissue is seen. The individual components are described (e.g., dense collagenous tissue, normal lobules, fat), but no abnormalities are seen. This normality is of course contingent on a diagnostically-relevant region of tissue having been biopsied, sectioned and prepared. Radiological consultation can determine whether this normal result is likely or unlikely, given pre-existing imaging abnormalities.

B2: ‘benign’: Fibroadenomatous or fibrocystic changes, sclerosing adenosis, usual-type hyperplasia, columnar cell changes, inflammatory lesions (a wide range including duct ectasis, mastitis, abscesses, etc.), or fat necrosis.

B3: ‘lesion of uncertain malignant potential’: Papillary lesions, radial scarring/complex sclerosing lesions, atypical ductal hyperplasia, flat epithelial atypia, lobular neoplasia (i.e. Atypical Lobular Hyperplasia and Lobular Carcinoma in Situ), phyllodes tumour, or other spindle cell lesions such as myofibroblastoma. Naturally, the risk of upgrade related to presence of atypia will need to be commented upon.

B4: ‘suspicious for malignancy’: Malignant material insufficient for definitive diagnosis, detached cells, DCIS involving partial duct space or low-grade DCIS in few duct spaces, probable carcinoma in a crushed core.

B5: ‘malignant’:

B5a: Malignancy in situ (e.g., DCIS/pleomorphic LCIS/encapsulated papillary carcinoma).

B5b: Invasive breast carcinoma.

B5c: Malignant, invasion status not assessable.

Similar systems are used by other professionals; for example R1-R5 in radiological assessment, P1-P5 for clinical examination signs; this allows all specialties to align their impressions of the patient’s disease; in effect, to ‘speak the same language’. This forms the basis of ‘triage assessment’ which in essence means assessment by all 3 specialty groups at the same time, allowing the MDTM to look for concordance across all specialties in giving an accurate diagnosis of breast cancer [See Figure 1]. For example, a C2/B2 pathology report with benign radiological (R2) and clinical (P2) features is concordant for a benign diagnosis.

The rate of MDT decisions deemed ‘concordant’ in medical literature (specifically, for oncologists, histopathologists and radiologists in a given MDTM to broadly agree on a diagnosis and on a treatment plan for that diagnosis) for MDT decisions is high in most situations studied, with some studies citing rates higher than 90%.21 As expected, concordance between team members [See Figure 2] as a whole leads to better outcomes, with commensurately increased accuracy in diagnosis, and faster treatment times.22 In some tertiary care centres dealing with breast cancer referrals, the MDT panel may disagree with the single-physician diagnosis given before referral in a significant percentage of cases, and alter diagnosis as a result, to improve and update management plans.23,24 Such disagreement is often based on MDTM adherence to high-quality clinical practice guidelines, which have the potential to significantly improve patient outcomes over single-physician management.

Physicians working with breast cancer patients in regions with limited resources might protest that use of global guidelines implemented by higher-resourced nations is not possible. However, altering these guidelines to suit local resources, especially in lower-resource or middle-resource nations, has the capacity to improve treatment outcomes, according to the Breast Health Global Initiative.25

The MDT approach also has the considerable advantage of allowing recruitment into clinical trials. With the entire clinical team present and with strong administrative support, it offers an ideal opportunity to identify patients for eligible trials. This much-needed infusion of patients into cancer-care trials can only improve the perceived quality of evidence produced by these trials, and enhance evidence-based medicine as a whole. Early evidence of MDT setup with trial recruitment in mind has produced promising results of greater patient engagement.26 Current evidence indicates that patient safety is enhanced by a MDT approach with several studies showing better clinical outcomes for the majority of breast cancer patients over single-physician diagnosis and treatment,13-16 and improved patient survival.26

There are several explanations for these improved outcomes. Firstly, as many physicians learn both in training and from experience, a clinical team involving multiple people are very likely to consider more possibilities in the diagnostic process, have access to more information and experience, and to come to more complete conclusions than a single physician, however comprehensive her/his education and skills may be. Secondly, communication and cooperation is improved between clinicians who meet regularly and grow familiar with the intricacies of each other’s work. Self-evidently, a clinician who deals only with cases in their own specialty may be unaware of the strengths, challenges and frustrations in another specialties. MDT meetings, despite occupying a minority of a clinician’s time, gives them valuable insight into their colleagues’ perspectives and allows them to work more closely/efficiently together towards a common goal.28 This is not confined to doctors in different specialties, but includes inter-professional cooperation between physicians and specialty nurses, who are useful contributors to MDT cases.

Finally, as concordance in treatment decisions increases, there is less confusion about management plans and treatment outcomes may improve as a result. A secondary positive effect of this is that patients’ understanding of their treatment can be enhanced by a clear management path.29
ROLE OF THE HISTOPATHOLOGIST IN THE MDTM (AND CONCURRENT BENEFITS)

Information provided by the histopathologist plays a key role at every stage of patient’s care, from diagnosis to treatment and even in cases of recurrence/metastasis.

In biopsy reporting, a histopathologist confirms the pathological report during slide review, and clarifies the natural ambiguities and uncertainties that are part of any tissue analysis. In cases with subtle abnormalities (e.g., micro-calcifications, borderline tumour grading), their expertise is called on to provide context. He/she may guide the next steps of treatment in specific situations (e.g., papillary lesions with atypia, or fibroepithelial lesions that necessitate a secondary excision over repeated biopsy).[9]

In post-operative cases, a histopathologist performs a limited and pragmatic slide review, ensures their report complies with minimum dataset requirements, and confirms that data entered into the MDTM record is correct. Information provided by pathology/pathologist in terms of traditional and newer prognostic and predictive factors. For example, tumour grade, type, size, lymphovascular invasion, lymph node status and ER/PR and Her-2 status are vital to guide next steps for breast cancer patients. They may be called upon again to clarify contentious points (in a breast cancer context, for instance, to correlate size of DCIS with extent of calcifications, excision margins and completeness.

Providing an in-person pathological opinion to one’s colleagues allows for real-time back-and-forth discussion on subtle features and hence proper consideration of a patient’s tissue biopsies, rather than a single fixed report summary; it advantages both the histopathologist and the MDT team as a whole, and entire surgical treatment plans may occasionally be altered by the opinion of the histopathologist alone.[9]

Triage of tissue for molecular testing and the opinions of histopathologists on testing feasibility is now integral to the diagnostic process. In this way, pathologists are far more influential on treatment plans and specific pharmacological approaches than ever before.[12,13]

Apart from the obvious benefits of the MDTM to the patient, the MDT process also advantages the histopathologists themselves as they are removed from an isolated position and able to actively participate in patient management. Their understanding of clinical processes (radiological, surgical, oncological) has improved through exposure, which their highly technical and specialized field often lacks. Their relationship with the clinical team as a whole has also improved,[14] and their professional opinion given in person (for example, to clarify uncertainties in the representative nature of a biopsy, or on subtle abnormalities in borderline cases) may be more respected than an impersonal, typed report.[15]

CHALLENGES AND BARRIERS

The total healthcare workforce has not kept pace with increased cancer incidence, and the total work-time of senior clinicians occupied by MDTM has commensurately increased.[16] With resultant time pressures and a concentration of clinical experience in one place, patient discussions can be as short on average as 2 minutes.[17,18] As one can easily imagine, finding a time slot which all professionals who need to be consulted as part of MDTM can be an administrative challenge, not to mention bringing them together into a single location. As discussed earlier, there are some technological means to help dissolve geographic separation (meeting at geographically central locations for all team members, or video linking).[9]

For the histopathologist, one potential disadvantage of MDT face-to-face interaction is lack of full contextual information and time to provide a reasoned evidenced response. Clinicians may express frustration with the uncertain nature of tissue analysis, seek answers that do not exist, or request new tests not yet in clinical use for their novelty over their evidential basis. New cases may be added to the list at the last minute, allowing no time for analysis or consideration. Some cases may require long discussions of radiological/clinical evidence, with no pathological input.

Cultural factors may also present barriers, particularly in international healthcare settings where single-physician-management is the norm, and clinicians operate with higher levels of personal autonomy. Nevertheless, physicians in India and Pakistan have argued that MDT development and implementation is strongly in the public interest.[30]

Cost-effectiveness is difficult to quantify, but overall MDT appears to justify the investment made in its development and maintenance, though scholars argue that more rigorous study is required.[40] Given the increased load of cases on MDT and the high value of senior clinician time, some researchers have suggested a two-tiered approach to distinguish between cases that require brief review on the basis of the facts, and those which require in-depth discussion.[41]

In countries such as UK, where MDTM practice is well established and robust guidelines exist for patient care, there are calls to transform MDTMs to make them more time and cost-effective, and NHS Improvement (the body overseeing quality improvement and evidence-based-practice) has appointed professionals to oversee this process.[42]

“The main purpose for the introduction of Multidisciplinary Meetings in the late 1990s early 2000s was to increase evidence-based practice and to stop individuals from treating patients outside accepted standards. The role of MDTMs has developed over time into one of a treatment decision-making body for key points along the patient journey. In recent years clinicians and particularly those involved in diagnostic services, have found that Multidisciplinary Meetings are causing consider pressures

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CONCLUSIONS

After decades of practice, study and improvement, multidisciplinary team care has been tested, put into wide use and stood the test of time. Its practice has strong clinical evidence to support its utilization, with increases in diagnostic accuracy, treatment planning and patient health outcomes.[13,14,16,18,21,44]

What new applications may be used in the future? MDT continues to develop and be improved by quality improvement frameworks, and new applications to aid efficiency (e.g., virtual MDT) are being developed.[46] Computerized decision support in line with evidence based guidance on cancer management has been shown to improve compliance in cancer MDTMs.[46] Today, quality improvement frameworks for MDTM in cancer care, new clinical tools and frameworks for their improvement are under development in several nations.[42-48] This creates firm assurances that the MDTM approach will continue to be modified and improved in line with evidence-based medicine.

The practice of medicine worldwide has a wide spectrum of practice and use. It follows that case history, histological/pathological information and treatment options are presented in radically different ways depending on nation and healthcare system. It is hoped by the authors that wider audits of clinical care and a larger evidence base on the usage of MDTMs may help create a well-evidenced framework for use worldwide in the future.[13,25] Producing such frameworks will require hard work and investment in global MDTM implementation, from clinicians across many nations in years to come. Nevertheless, as we continue to argue, the advantages of MDTM far outweigh the challenges in implementing their use and show great promise in continuing to improve patient care, clinical outcomes, and remission rates in the fight against cancer.

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