

The Quality of Pathology and its Reporting on Cancer Survival: The Need for Proforma Reporting

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Abstract

Background: *The histopathology report provides information that facilitates accurate staging of patients with cancer and also serves as a tool for the assessment of the quality of pathology in general. But, however the variability in form, content and quality of the pathology report often obviates this important role in the management of cancer patients*

Materials and Methods: *This report reviews the literature on the quality of pathology and its reporting on cancer prognostication and survival and in particular the role structured reporting formats play in improving the quality and utility of such reports. The review was done primarily through search of the databases of MEDLINE, EMBASE and PubMed covering the period 1950 to 2010 with key words quality, cancer, pathology, histopathology, report, proforma and synoptic.*

Result: *The informational content of many routine pathology reports is shown to be inadequate for quality patient management.*

Conclusion: *Proforma reporting of cancer cases is thus recommended.*

Keywords: Pathology report, cancer, proforma

Introduction

Treatment options in cancer have greatly increased in number over the past two decades and therapeutic decisions are now made based on input from a multidisciplinary team including surgeons, oncologists, radiologists and pathologists.¹ In addition to the service to the patients, the pathologist also provide valuable feedback to the other members of the multidisciplinary team useful for the evaluation of their services.² For the surgeon they provide feedback on completeness of excision, for the radiologist confirmation of the accuracy of

preoperative staging and the oncologist they describe the effectiveness of neoadjuvant therapy and identify patients in need of adjuvant therapy amongst others.

The pathology report on a cancer specimen provides critical information related to diagnosis of the tumour in the first instance and also provide factors related to prognosis. This information ultimately drives treatment choices for the patient. There is an increasing requirement for detailed prognostic information on each cancer diagnosed,

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especially in resection specimens, because of the increasing realisation of many values they provide in the face of major advancements in the understanding and treatment of cancer.³

The adequate surgical pathology report not only documents the presence and accurate typing of cancer but also contains information related to tumour grade, size, depth of penetration, lymphatic and blood vessel involvement, status of the surgical margins and other morphological and sometimes ancillary results including tumour markers.⁴ It is important for all these to be clearly stated in the report as they are the basis of staging of cancers and subsequent treatment decision.

Histopathological reports also provide information for cancer registration, clinical audits, assessment of the accuracy of new diagnostic and preoperative staging techniques and ensuring comparability of patient groups in clinical trials.⁵ For these reasons, therefore, histopathology reports have to be of a high quality as much as possible.

This report reviews the literature on the quality of pathology and its reporting on cancer prognostication and survival.

Literature Search Methodology

The following databases were used in the literature search covering 1950 to 2010 – MEDLINE, EMBASE and PubMed. Key words searches on quality, cancer, pathology, histopathology, report, proforma and synoptics were used with truncation signs where necessary. The results were combined with the Boolean operators OR + AND as necessary. The references of the initial papers were also checked for other relevant papers. Overall, the searches yielded 587 papers and 58 were finally selected and reviewed.

The first search on quality of pathology yielded 549 papers. We read through the titles of these and selected the relevant 27 with information

on quality of pathology on cancer. The abstracts of these 27 papers were read but only 20 finally selected. The 'find similar' function of the databases was used to check for more relevant articles and 38 papers were eventually found on the topic. The papers were downloaded and read. More relevant references were checked for and this yielded another 10 papers making a total of 48 papers. For the search on proforma reporting, 10 relevant papers were found, downloaded, read and included for this review.

Defining High Quality Pathology

Defining the quality of histopathology, both generally, and specifically in cancer services is challenging given the subjective nature of the discipline of pathology.⁶ The histopathologist's role is to find information, analyse it and present it in the form of a report based on the macroscopic and microscopic examination of the material available. Thus, the interpretative reports rendered by histopathologists are the only tangible manifestation of their expertise, training and experience to the end-users of the reports. Such reports are often the primary means by which histopathologists provide patient care through the clinicians. The pathology report therefore, becomes a tool in the assessment of the quality of pathology in general.

Histopathology reports are, in reality, often extremely variable in form, content and quality but ideally should be made up of standard language, structured format and consistent content.⁷ It has been evident for decades that pathology reports are variable even within a single institution.⁸ There is a spectrum of cancer pathology reporting which ranges from simple narrative report using a single free text field of data to sophisticated proforma reporting.⁴ In practice most cancer pathology reports lie somewhere in the middle.

There are four essential measures of quality in cancer pathology reporting: timeliness, accuracy, completeness, and usability.⁴ Cancer

pathology reports should be timely as there is need for urgency in starting treatment. The reports need to be correct, and contain all the relevant information required for diagnosis, prognosis and further treatment decisions.³ Fortunately, error rates in surgical pathology are relatively low at a rate of less than 1%.⁹

The completeness of a cancer pathology report relative to an accepted standard is of utmost importance as it is the means of conveying the required information for patient management and therefore, an important reflection of overall quality.^{3,10} The usability or accessibility of the data in the report is especially important to other healthcare-related bodies and governmental agencies such as cancer registries, health planners, epidemiologists and others involved in quality improvement activities and population-based research which utilise pathology reports for their functions.⁴

Introduction of Datasets

With the increasing recognition of the important role played by pathology reports came the need to assess the quality of them. In the 1990s, a number of regional audits of the information contents of pathology reports for various cancer sites^{10,11,12} clearly demonstrated that the prevailing free text reporting style was failing in the provision of adequate informational content on cancer specimens for quality patient management and cancer registration. These audits showed that less than 77% of free style colorectal and upper gastrointestinal (GI) cancer reports in Wales (a homogenous health service region in the United Kingdom) met the minimum standards against which they were audited. Importantly, the audits demonstrated that data items central to staging and treatment decision were frequently missing with a 52% and 30% circumferential margin status and positive lymph node reporting rates in the colorectal audit by Bull et al.¹² The conclusions and recommendations were that template proforma reporting should be introduced to

improve the quality of cancer pathology reports.

There are a number of organizations, such as cancer registries and pathology professional bodies, which have been involved in the development of content standards and checklists for cancer pathology reporting. For example, in the UK, The Northern and Yorkshire Cancer Registry (NYCRIS), in collaboration with the histopathologists in the Yorkshire region, first published a proforma for the pathological reporting of colorectal cancer resections in 1995.¹³ This was largely adopted, with some modifications, by the Royal College of Pathologists (RCPATH) for the first edition of the colorectal minimum dataset (MDS) in 1998.¹⁴

The College of American Pathologists (CAP) and the RCPATH have published standards on required content for reporting various tumour types.¹⁵ The CAP, in particular, through its Cancer Committee has developed more than 70 specimen-specific checklists covering over 40 tumour types and the RCPATH has developed over 27 of these checklists. These checklists are maintained using site-specific expert panels and are updated on a regular basis to include changes in the widely accepted International Union Against Cancer TNM staging system.

Standardization of reporting is the optimal way to ensure that information necessary for patient management, prognostic and predictive factor assessment, grading, staging, analysis of outcomes, and tumour registries is included in pathology reports.^{16,17} Cancer pathology reports given in a proforma format are intuitively easier to decipher than ones that are presented in a narrative or paragraphic style, minimizing the risk of misinterpretation and clinical error.⁴ Proforma reporting can save time since all important diagnostic and prognostic factors are laid out in a list or table with headers and responses rather than being buried in paragraphic text fields.

Drawbacks of MDS

There are drawbacks to the use of proforma however. The main one is that it restricts the freedom of the pathologist to write specimen-specific reports especially when dealing with difficult or unusual cases with the danger that new insights into the understanding of cancer may be missed.¹⁸ This problem can however be addressed by the provision of space on the forms for free text. Also, personal preferences of pathologists may conflict with items on the forms as there is still disagreement amongst pathologists as to the preferred terms for some of the items and the clinical significance of some of the morphological parameters.⁵ This may lead to reluctance by some pathologists to use the MDS.

Another drawback of proforma reporting relates to the strength of scientific evidence on which they are based. In most of the MDS from RCPATH written by site-specific experts, there is no grading of the strength of the evidence behind them. For example, the evidence on which the reporting of tumour grade in colorectal cancer has been shown to be very weak.¹⁹ Also, pathologists from Europe have strongly criticised the change to lymph node reporting in the 6th edition of TNM for colorectal cancer as lacking strong scientific basis.²⁰

Selecting a Factor to Assess Quality

The information provided in cancer pathology reports, especially in proforma format, can be used by organizations or researchers to assess quality of reporting and quality improvement.¹⁵ An example in colorectal cancer reporting is the harvesting of lymph nodes from resection specimens. The total number of lymph nodes sampled and the number involved by metastatic tumour can be derived with ease from a proforma report and useful for staging of patients.²¹ Also, a number of studies have consistently demonstrated that lymph node retrieval has improved with use of MDS and is linked to tumour stage and patient prognosis.^{22,23,24,25,26,27,28}

Lymph node retrieval has also been shown to be intimately linked with rates of circumferential margin status, peritoneal involvement and extramural vascular invasion^{13,29,30} because the more diligently the pathologist looked for lymph nodes, the better the examination of the specimen and the reporting of important factors. The total number of lymph nodes retrieved therefore appears a good measure of the quality of pathology. Under sampling lymph nodes in cancer specimens can lead to under-staging and mis-utilization of adjuvant chemotherapy.^{13,31,32,33}

Likewise audits of tumour depth of penetration (tumour stage) and margin positivity in cancer resections^{5,34,35} are facilitated by proforma pathology information and these have been useful in reducing the local recurrence rate of rectal cancers. In recent times too, the systematic evaluation of the quality of surgery has been made easier as a result of proforma pathology reporting with the added benefit of improvement in cancer surgery and improvement in survival.^{2,3,27,34,36}

Have They Worked?

Improved reporting

Several audits have demonstrated that the use of proforma reporting has improved the quality of pathology reports and their contents at various cancer sites but especially colorectal,^{13,18,38,39,40} breast,^{18,41,42} uterine cervix,⁴³ pancreas⁴⁴ and upper GI.⁴⁵ These audits, though varied in their quality with some simply comparing historical narrative reports with proformas,^{38,45} others comparing the use of proformas alongside narrative reports⁴⁰ and one randomised controlled trial of the use of proforma;¹⁸ all showed a significant improvement in the quality of pathology reports using a proforma in comparison to narrative reports by providing more than 90% of data items in the reports in contrast to the less than 77% rate previously found with use of narrative reports only.^{11,12}

Relation to Cancer Survival

The use of MDS has not only been shown to improve the quality of reporting but can be used to validate the relationship of these data items to cancer survival using large population-based data.^{4,13} Maughan *et al*¹³ confirmed that all the variables within the RCPATH MDS for colorectal cancer are of prognostic significance and showed that patients with adverse factors such as positive lymph nodes, margin positivity and vascular invasion had a worse prognosis compared to those without these factors.

In the same way, high quality pathology has also been shown to be useful in describing subsets of cancer patients suitable for treatment as clearly demonstrated by the work of Morris *et al*^{29,30} in Dukes B/Stage II colorectal cancer. They demonstrated that Dukes B patients who had any of the high risk factors of peritoneal involvement or vascular invasion had a lower survival compared to those with one positive lymph node (Dukes C) which is the benchmark for adjuvant therapy. However, identification of such at risk Dukes B patients depend on high quality pathology.

Effects of Poor Quality on Survival

Without any doubt, the use of proforma has significantly improved the quality of cancer pathology reporting especially increased awareness of their importance from the professional bodies. However, to get the full benefits from this, it is equally important that the forms are completed in full. The completion rates for these forms are still not 100% and sometimes very important information needed for correct staging and treatment may be missing.^{4,13,18,45} In the study by Maughan *et al*¹³, it was reported that colorectal cancer patients in whom specific variables (such as vascular and peritoneal invasion) were not reported appear to have an intermediate survival between those who possess the factor and those who did not, suggesting that absence of reporting does not necessarily mean absence

of the factor. Such factors are used in allocating patients to treatment groups and failure to report them may be construed as absence of the factor, resulting in the patient being under treated.

The above issues appear to relate to competence and expertise on the part of the pathologist. Comparison of reports from a single centre by a specialist pathologist showed a higher rate of reporting of all items compared to reports from a region done by many pathologists.²⁹ Therefore, there is a role for education and training of pathologists in the use of proformas for reporting cancer in order to improve quality further.

Conclusion

High quality histopathological reporting of cancer resection specimens provides important information for both the clinical management of the affected patient and for the evaluation of health care as a whole. In recent years, the complexity of cancer pathology reporting has significantly increased and the use of proformas has been shown to improve the quality and utility of reports. Importantly, usage of these cancer datasets has made it possible to validate the prognostic significance of data items and relate them to survival. However, there is still a need for continuing education of pathologists in order to maintain and improve the quality of pathology and its reporting in cancer patients.

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