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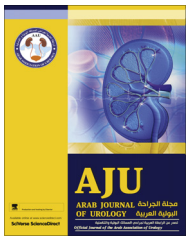

ONCOLOGY/RECONSTRUCTION
REVIEW

Systematic methods for measuring outcomes: How they may be used to improve outcomes after Radical cystectomy

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KEYWORDS

Quality assurance;
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Cumulative summation;
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ABBREVIATIONS

RC, radical cystectomy;
M&M, mortality and morbidity;
POSSUM, (Portsmouth) Physiological and Operative Severity

Abstract In the era of managed healthcare, the measuring and reporting of surgical outcomes is a universal mandate. The outcomes should be monitored and reported in a timely manner. Methods for measuring surgical outcomes should be continuous, free of bias and accommodate variations in patient factors. The traditional methods of surgical audits are periodic, resource-intensive and have a potential for bias. These audits are typically annual and therefore there is a long time lag before any effective remedial action could be taken. To reduce this delay the manufacturing industry has long used statistical control-chart monitoring systems, as they offer continuous monitoring and are better suited to monitoring outcomes systematically and promptly. The healthcare industry is now embracing such systematic methods. Radical cystectomy (RC) is one of the most complex surgical procedures. Systematic methods for measuring outcomes after RC can identify areas of improvements on an ongoing basis, which can be used to initiate timely corrective measures. We review the available methods to improve the outcomes. Cumulative summation charts have the potential to be a robust method which can prompt early warnings and thus initiate an analysis of root causes. This early-warning system might help to resolve the issue promptly with no need to wait for the report of annual audits. This system

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Score for the enUmeration of Mortality and morbidity;
VLAD, variable life-adjusted display;
(RA-)CUSUM, (risk-adjusted) cumulative summation;
RCA, root-cause analysis

can also be helpful for monitoring learning curves for individuals, both in training or when learning a new technology.

Introduction

The Institute of Medicine described the quality of care as '*the extent to which health services are provided to individuals and patient populations, to improve the desired health outcomes, the care should be based on the strongest clinical evidence and provided in a technically and culturally competent manner with good communication and shared decision making*' [1]. Individual surgeons and surgical departments have always taken pride in the quality of care they offer, and increasingly they are now mandated to report them to peer-review organisations and third-party payers. The objective measurement of quality is a routine practice in manufacturing industries, but is not an easy task, especially for a service industry such as healthcare. Methods for measuring outcomes are critically dependent on the quality of reporting systems. It is fundamental for these systems to be free of bias and be able to endure rigorous statistical analysis.

In medical science these stringent methods should not only be able to accommodate variations in patient factors, but should also be able to identify the disparities among different surgeons and institutions. In many situations this problem is compounded by a lack of consensus on defining 'a complication', and furthermore, there is little agreement on the comparative benchmarks. The traditional methods of surgical audits are periodic and for most procedures are typically annual. Therefore, there is a long time lag before any effective remedial action could be taken. To reduce this delay, manufacturing industry has used statistical control-chart monitoring systems, as they offer continuous monitoring and are better suited for monitoring outcomes systematically and promptly.

The healthcare industry is also beginning to use these methods to improve outcomes. The first report of the application of control charts in assessing surgical procedures was in cardiac surgery [2]. Radical cystectomy (RC) is one of the most complex procedures in urological surgery. During the course of treatment and recovery after RC, a patient uses many hospital services. An uncomplicated course is a reflection of the quality of all the services provided in an integrated and efficient manner, including the surgical technique, which is a critical component and is potentially responsible for many complications. The expertise in this procedure might be used to reflect on the surgical abilities and the learning curve of an individual surgeon. Systematic methods for measuring the outcomes after RC can identify areas of improvements on an ongoing basis, which can be used to initiate timely corrective measures. We review the currently available methods used to improve the outcomes after RC.

Mortality and morbidity (M&M) meetings

The proceedings of M&M meetings have been traditionally used to evaluate the quality of surgical care. These meetings determine the quality of management before, during and after surgery, the main objective being educational, but they lack a systematic process of initiating effective corrective measures to improve any system errors. High-risk surgical procedures like RC are often the focus of debate in these meetings. There are lengthy discussions on events around surgical operations, where negative or adverse outcomes are debated. Due to the sensitive nature of the discussion most of these meetings are not multidisciplinary. These meetings are often criticised as being 'incestuous' and hence are limited in the scope of the outcomes open for debate [3]. These meetings are also resource-intensive, as input is required from highly trained individuals. The value of this traditional M&M method is questionable in current times, as the bar of measuring 'quality' has been raised by other industries.

Surgical audits

Surgical audits determine the incidence of postoperative complications. These periodic audits are either initiated on demand or are ongoing, and they help to determine the 'point prevalence' of an outcome. The incidence of complications is used as a surrogate marker of quality. Sometimes there can be some disagreement on the definition of a 'complication' and these definitions might be variably used at different centres. In urology there are no standard guidelines or criteria to report outcomes [4]. To acquire credible evidence a standardised system is