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Cystectomy readmissions and the opioid epidemic: An opportunity for synergistic improvement

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Abstract

Readmission following radical cystectomy is common, occurring in approximately one quarter of patients. Traditional efforts to reduce these readmissions have had limited success. Overprescribing of opioids after surgery, including cystectomy, is known to exist and to contribute to opioid abuse and the national opioid epidemic. However, the relationship between postoperative opioid prescribing patterns and readmissions is not well described. In this article, we explore the impact of novel readmission reduction efforts (i.e. minimally invasive approaches, enhanced recovery after surgery pathways, and policy interventions) and examine the intersection of cystectomy readmissions and the national opioid epidemic.

Key Words: Bladder cancer; Cystectomy; Complications; Readmission; Opioids

Background

Radical cystectomy is the standard treatment for patients with muscle-invasive bladder cancer [1]. This surgery includes complex extirpative and reconstructive components and is associated with significant morbidity. For example, perioperative complication rates range from 50-65% [2,3]. As a result, hospital readmission following radical cystectomy occurs in roughly a quarter of patients. This rate is among the highest of any major surgery and one that has remained unchanged for decades [4-7]. Furthermore, readmissions after cystectomy tend to be high intensity, often requiring repeat imaging, additional procedures, and intensive care. The corresponding length of stay (e.g., 5-7 days) leads to significant patient and health system burdens [8,9]. Decreasing the readmissions following cystectomy therefore represents a high value target to improve quality and decrease cost in healthcare.

Despite multifaceted approaches to readmission reduction following cystectomy, gains have been minimal. However, the role of opioid medications in readmissions after cystectomy remains an unexplored area. Opioid medication is known to increase the duration and risk of ileus following cystectomy, which is a leading reason for prolonged length of stay and readmission [10,11]. Opioid medications have historically been the mainstay of pain management following cystectomy, often through high intravenous dosing (i.e., patient controlled analgesia) and large prescriptions given upon discharge. The increased use of minimally-invasive surgery and implementation of ERAS protocols should allow reduction in the use of opioid medications [12] both peri-operatively and

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at the time of discharge. Though we currently lack evidence determining the association between opioids and readmission, adopting a multimodal approach to pain management to reduce opioid medication after cystectomy is likely to decrease ileus. Equally as important, leveraging these readmission efforts to reduce excess opioid prescribing by urologists will contribute significantly to addressing the ongoing opioid crisis in the US.

While efforts to clarify readmission risk and identify interventions to reduce that risk have increased over the past decade, there remains a lack of consistently predictive patient, disease, and hospital factors to identify at-risk patients [10,11,13]. Despite this, many believe a proportion of readmissions after cystectomy are predictable and potentially preventable as nearly half of readmissions occur within the first week following discharge. In fact, the majority of readmissions after this major cancer surgery occur within two weeks of discharge [6,10]. In light of the early post-discharge timeframe, investigators have hypothesized factors leading to the readmission may actually be present at the time of discharge. In fact, a root cause analysis demonstrated 26% of readmissions were the result of such modifiable factors [14].

Given the readmission burden after radical cystectomy and likelihood a significant proportion may be modifiable, efforts have examined the roles of minimally invasive surgery [6,15-18], enhanced recovery pathways [19-22], and health policy [7,23] in reducing readmissions. Herein, we highlight relationships between readmissions after radical cystectomy and each of these efforts to address this seemingly refractory clinical and policy dilemma. We further examine the intersection of readmissions and the opioid epidemic to direct next steps for research and practice, and explore the possible synergy between efforts to reduce cystectomy readmissions and those to decrease urologists' contribution to the national opioid epidemic.

Minimally-invasive surgery

Minimally-invasive approaches are associated with reduced readmissions after major cancer surgery [24] through decreased complication rates and faster recovery from smaller incisions. These notions led to the rapid adoption of robotic-assisted radical cystectomy (RARC) with the hope of improved outcomes [18]. While initial retrospective studies demonstrated less blood loss, shorter length of stay, and comparable oncologic outcomes for RARC compared to open cystectomy, there were no differences noted in complication rates or readmissions [18,25,26]. Two randomized controlled trials confirmed similar complication rates between RARC and open cystectomy [15,16]. A common criticism of these studies is the fact that the majority of urinary diversion was still performed with the traditional, open approach. Though data comparing complications for open and intracorporeal urinary diversion remains limited to early-adopting centers of excellence, complications and readmission rates still remain similar between approaches [27-29]. Based on available data, a minimally-invasive approach to radical cystectomy does not appear to lower readmission risk.

Enhanced recovery after surgery (ERAS) pathways

Enhanced recovery after surgery pathways are multifaceted approaches to standardize peri-operative care [30]. They typically include over 20 items addressing pre-, peri-, and post-operative care in order to reduce surgical stress responses known to increase morbidity. Some key components include patient optimization prior to surgery, minimizing anesthetic stress by omitting bowel preparation, decreasing the fasting period to 2 hours pre-operatively, avoiding overhydration and narcotics, using minimally-invasive surgical approaches when possible, omitting nasogastric and surgical site drains when possible, early feeding and ambulation to decrease post-operative ileus, and employing a multimodal approach to pain management with the goal of minimizing opioid medications. These protocols also routinely employ the use of alvimopan, a mu-opioid receptor antagonist, which has been shown to decrease ileus [31]. ERAS protocols require a multidisciplinary collaboration involving surgeons, anesthesiologists, nutritionists, physical therapists, and other support staff. To date, the benefit of individual components of ERAS protocols is not well understood, but rather, implementation of the multiple components appears to improve some perioperative outcomes. This need for implementing a complex set of interventions by a multidisciplinary team has been a barrier to widespread adoption, however, there are multiple centers across the Unites States (US) and internationally that have reported their experience with ERAS protocols for radical cystectomy [20-22]. These studies demonstrate lower peri-operative complication rates and significantly shorter length of stay for the surgical admission among ERAS patients. The decrease in length of stay appears to be strongly driven by decreased use of opioid medications in the immediate post-operative period [12]. However, ERAS does not seem to translate to reduced readmissions. In fact, a meta-analysis of eight European studies did not reveal differences in readmission rates between patients on ERAS protocols and those receiving standard care [22]. Although differences in practice patterns between Europe and the US make comparisons difficult (i.e., initial length of stay is nearly double in the former), cohort studies in US patients confirm similar readmission rates ranging from 25-33% [20,32,33].

Health policy

As avoidable and unnecessary readmissions are emblematic of poor quality care, they have been the target of multiple policy efforts, including the Hospital Readmissions Reduction Program (HRRP) and programs aimed at

transferring accountability for patient care from payers to providers and hospitals like Medicare's Accountable Care Organizations (ACOs) and Bundled Payments for Care Improvement [7,34-37]. In general, these programs identified certain targeted medical conditions or surgical procedures and levied either incentives or penalties for meeting benchmarks. In the case of Medicare ACOs, a hospital-wide readmission measure was used. Nonetheless, cystectomy, or major cancer surgery in general, have not been specifically targeted. Given the nascent nature of these policies, their long-term success remains unknown though early analyses have demonstrated modest gains. Readmissions decreased for both medical conditions and surgical procedures targeted by the HRRP in response to the policy [34,35]. Whether this was due to actual decreases compared to baseline or modifications in coding and eligibility has been questioned [38]. Regardless, for surgical conditions, these improvements were limited to the targeted procedures and reductions in readmissions did not spill over to non-targeted procedures [34]. For cystectomy specifically, there appeared to be no impact of the HRRP on readmissions. Readmissions following major surgery also decreased in hospitals participating in Medicare ACOs, but again, this was driven predominantly by changes following orthopedic procedures and readmissions following cystectomy remained unchanged [7].

Role of perioperative opioids in readmission and the national opioid epidemic

Despite multifaceted approaches to readmission reduction following cystectomy, gains have been minimal. However, the role of opioid medications in readmissions after cystectomy remains an unexplored area. Opioids are known to increase the duration and risk of ileus following cystectomy, which is a leading reason for prolonged length of stay and readmission [10,11]. Opioid medications have historically been the mainstay of pain management following cystectomy, often through high intravenous dosing (i.e., patient controlled analgesia) and large prescriptions given upon discharge. The increased use of minimally-invasive surgery and implementation of ERAS protocols should allow reduction in use of opioid medications both peri-operatively and at the time of discharge. Interestingly, despite the expectations for decreased pain from minimally invasive approaches and the emphasis on opioid reduction with ERAS pathways, early data indicates that the amount of opioids prescribed at discharge have not decreased significantly [39,40]. Though we currently lack evidence determining the association between opioids and readmission, adopting a multimodal approach to pain management to reduce opioid medication after cystectomy is likely to decrease ileus while simultaneously addressing the ongoing opioid crisis by reducing excess opioid prescribing at discharge.

In 2016, there were 42,249 deaths from opioid overdose nationally, with 42% of these occurring directly from abuse of prescription opioids [41. Initial efforts to address this crisis on a national level have focused on decreasing high-dose opioid prescriptions in patients with chronic pain [41]. Leaders in local and state government have responded to this crisis with a variety of legislative and non-legislative measures, most notably the Heroin, Opioid Prevention and Education (HOPE) Agenda [42] and the Enhanced Prescription Drug Monitoring Program [43]. These measures have addressed the opioid crisis in many ways, including access to treatment and improved reporting requirements for opioid prescriptions, but have not offered opportunities for physicians to address their own opioid prescribing practices.

Overprescribing of opioids is known to contribute to opioid deaths. Furthermore, overprescribing leads to unused medications that are available for diversion and abuse. Compared to chronic pain conditions that are treated with opioids over protracted periods of time, overprescribing is much more likely for acute pain conditions, like surgery. According to CDC analyses, 3 out of 4 heroin users began by abusing opioid medications [44]. Despite the state and national attention given to this topic, structured efforts to reduce opioid overprescribing in surgical populations have been limited. While family practice providers prescribe the majority of opioids at 18%, surgeons are responsible for 10% of all opioids prescribed, a rate twice that of pain management specialists [45]. Unlike patients treated by primary care or pain specialists who tend to have chronic pain needs, the majority of patients undergoing surgery are opioid naïve. Among patients undergoing urologic or surgical procedures without prior opioid use, up to 6% become long-term opioid users following the initial peri-operative prescription [46] Conversely, multiple studies in urology [40,47] and general surgery [48,49] have demonstrated that patients consume less than half of opioids prescribed after surgery, suggesting an easy target for intervention.

To date, national and state-level policy efforts have focused on curbing prescribing of high dose opioids and have not addressed overprescribing in surgical populations. Many surgical specialty organizations, including the American Urological Association [50], have issued general guidelines to encourage reductions in opioid prescribing, however, data regarding appropriate perioperative opioid prescribing is sparse. Broad-based efforts to directly engage urologists to address the opioid epidemic are limited. Augmenting perioperative care to minimize reliance on opioids and critically evaluating doses prescribed at discharge following cystectomy may play a role in decreasing readmissions. This practice may also lead to changes following other urologic procedures, thus improving opioid stewardship among urologists and decreasing our role in the opioid epidemic.

Conclusions

Readmission following radical cystectomy remains common, occurring in over a quarter of patients. Increased adoption of minimally-invasive approaches and ERAS protocols

have led to decreases in complications, but have not significantly affected readmission rates. Similarly, health policy aimed at reducing readmissions has not translated to changes following cystectomy. Though the role of opioids in cystectomy readmissions has not been explored, a plausible mechanism for reducing readmissions by minimizing opioid related ileus exists. The lack of readmission reduction from other conventional efforts presents urologists with an opportunity to re-evaluate opioid prescribing practices after radical cystectomy with the goal of not only reducing readmissions, but also addressing the ongoing opioid epidemic. It is our hope that engaging urologists to critically evaluate opioid prescribing practices following cystectomy would ultimately lead to broader changes across the spectrum of conditions treated.

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