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Professional fee payments by specialty for inpatient open ventral hernia repair: who gets paid for treating comorbidities and complications?

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Abstract

Background The purpose of this study was to determine perioperative professional fee payments to providers from different specialties for the care of patients undergoing inpatient open ventral hernia repair (VHR).

Methods Perioperative data of patients undergoing VHR at a single center over 3 years were selected from our NSQIP database. 180-day follow-up data were obtained via retrospective review of records and phone calls to patients. Professional fee payments (PFPs) to all providers were obtained from our physician billing system for the VHR hospitalization, the 180 days prior to operation (180Prior) and the 180 days post-discharge (180Post).

Results PFPs for 283 cases were analyzed. Average total 360-day PFPs per patient were $3409 ± SD 3294, with 14.5% ($493 ± 1546) for services in the 180Preop period, 72.5% ($2473 ± 1881) for the VHR hospitalization, and 13.0% ($443 ± 1097) in the 180Postop period. The surgical service received 62% of PFPs followed by anesthesia (18%), medical specialties (9%), radiology (6%), and all other provider services (5%). Medical specialties received increased PFPs for care of patients with COPD and HCT < 38% ($90 and $521, respectively) and for the pulmonary complications ($2471) and sepsis ($2714) that correlated with those patient comorbidities; surgeons did not. Operative duration, mesh size, and separation of components were associated with increased surgeon PFPs ($p < .05$). At 6 months, wound complications were associated with increased surgeon and radiology payments ($p < .01$).

Conclusions Management of acute comorbid conditions and the associated higher postoperative morbidity is not reimbursed to the surgeon under the 90-day global fee. These represent opportunity costs of care that pressure busy surgeons to select against these patients or to delegate more management to their medical specialty colleagues, thereby increasing total system costs. A comorbid risk adjustment of procedural reimbursement is warranted. In negotiating bundled payments, surgeon groups should keep in mind that surgeon reimbursement, unlike medical specialty and hospital reimbursement, have been bundled since the 1990s.

Keywords Professional fee payments · Ventral hernia repair · Medical specialties · Postoperative complications · Comorbid conditions · Reimbursement

Patients referred to tertiary care medical centers for open repair of incisional and ventral hernia (VHR) are frequently referred due to complexity of the hernia and/or complexity of the patient, as the referring facilities and providers may not be equipped to provide needed care expertise. The medical complexities of patients with ventral hernia such as metabolic syndrome [1], COPD [2], and morbid obesity [3, 4] are common among patients with ventral hernia and are known to be associated with increased morbidity and unfavorable outcomes following VHR [1–4]. More technically challenging hernias such as parastomal hernias, multiple-recurrent hernias, and hernia repair in the face of contamination also are known to be associated with increased risk of postoperative complications [5–7].

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Providing care for medically complex patients is more expensive than caring for younger, healthier patients. Hospital costs are increased for patients with preventable comorbidities and resultant complications following VHR [8]. Diagnosis of superficial surgical site infection during inpatient VHR admission has been associated with substantially-increased hospital costs [9]; diabetes and increased American Society of Anesthesiologists (ASA) Class also have been shown to have an adverse financial impact [10].

While Medicare payments to the hospital are based on the inpatient prospective payment system (IPPS) associated with diagnosis-related groups (DRGs) [11], physician services are paid based on the Medicare Physician Fee Schedule (PFS). Payment to surgeons includes the payment for a surgical procedure itself, and, for many procedures, includes the payment for a global period that covers postoperative visits occurring between the date of the procedure and up to 90 days post-operatively. Relative value units (RVUs) for every current procedural terminology (CPT) code are established yearly to allow for budget neutrality [12]. No adjustments to surgeon fee payment are made based on patient comorbidities.

In an effort to move away from volume-based payment and toward increased value of care through performance-based payments, the Medicare Access and CHIP Reauthorization Act of 2015 provided that 30% of Medicare payments would be tied to quality and value through Alternative Payment Models by the end of 2016 and 50% by the end of 2018 [13]. One of these APMs is bundled payments which, "link otherwise unconnected payments for individual clinical services provided by clinicians, facilities, and other health care entities during an episode of care" [14]. Published information regarding the professional fees associated with ventral hernia repair is lacking, and there are no published data correlating professional fees and medical comorbidities. This study examines the relationships between patient comorbidities, surgical complications, and professional fee payments to surgeons and other specialties in order to inform ongoing discussions of APMs.

Materials and methods

This IRB approved study was a retrospective review of patients undergoing open VHR at a single academic medical center between October 2011 and September 2014. Perioperative risk and 30-day outcome data were selected from our local NSQIP database. Follow-up for wound occurrences, readmissions, and other major morbidity were extended to 180 days via review of the clinic medical record and phone calls to the patient. Professional fee payments to all University of Kentucky Medical Center providers were obtained for the VHR hospitalization for 180 days before the VHR (180Preop) and for 180 days post-discharge (180Postop).

Results

A total of 283 inpatient open VHR patients met our criteria for analysis. Patients had a mean age of 52.7 years (SD 13.2) and 56.5% were female, 62.5% were ASA class III or IV, and 79.5% had a clean CDC wound class.

Average total 360-day PFPs per patient were $3409 ± SD 3294, with 14.5% ($493 ± 1546) for services in the 180Preop period, 72.5% ($2473 ± 1881) for the VHR hospitalization, and 13.0% ($443 ± 1097) in the 180Postop period. The surgeon received 62.4% of 360 day PFPs followed by anesthesia (17.7%), medical specialties (8.8%), radiology (6.0%), and all other provider services (5.0%); (Fig. 1A, B).

Medical Specialty 360-day PFPs increased with patient age, ASA class, COPD, dyspnea, hematocrit < 38%, and creatinine > 1.2 mg/dL. Surgeon PFPs increased with age only and by a smaller percentage than the medical specialties. Radiology PFPs also increased with several patient risk factors (Table 1). Diabetes, hypertension, and smoking status were not associated with changes in any specialty 360-day PFPs. Anesthesiology/pain management PFPs were not associated with any patient risk factors.

Surgeon PFPs increased with the duration of operation, the size and type of mesh used, and in patients with

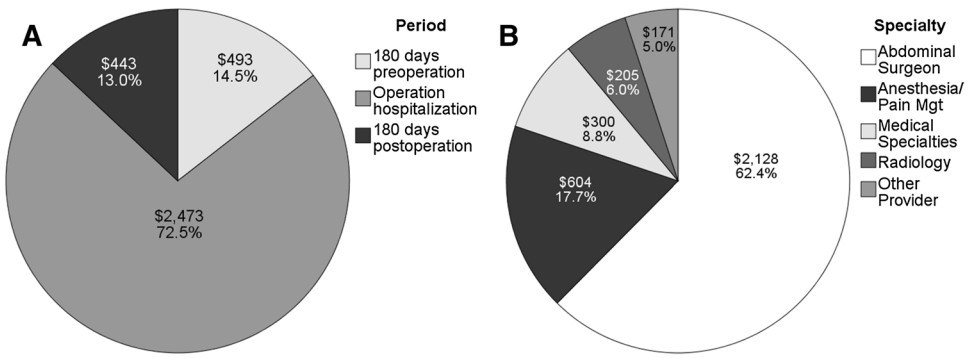

Fig. 1 Professional fee payments for patients undergoing open ventral hernia repair by period and by specialty

Table 1 Characteristics of patients undergoing inpatient open ventral hernia repair that were associated with increased professional fee payments (PFPs)

All patients	$N = 283$ (100%)	Average 360-day PFPs in US Dollars			
		Abdominal surgeon	Medical specialties	Radiology	Other providers
		$2128	$300	$205	$171
Female	160 (56.5%)				206
Male	123 (43.5%)				125*
Age, year		*	***	*	
≤45	85 (30.0%)	1928	174	159	
46–60	114 (40.3%)	2372	435	250	
61+	84 (29.7%)	2000	246	191	
ASA class			**	*	*
I or II	106 (37.5%)		113	151	122
III	163 (57.6%)		413	242	195
IV	14 (4.9%)		401	198	251
COPD	31 (11.0%)		390*	245**	
Dyspnea	35 (12.4%)		309*		236*
HCT < 38%	61 (21.6%)		821**	364**	
Creatinine > 1.2 mg/dL	28 (9.9%)		524**		

Obesity, smoking, hypertension and diabetes did not influence PFPs

Non-parametric tests of group differences significant at *$p < .05$; **$p < .01$; and ***$p < .001$

separation of components, but PFPs decreased in emergent or transferred patients. Wound class did not correlate with surgeon PFPs in this cohort of VHR without major concomitant procedures (Table 2). Anesthesiology PFPs increased with duration of the operation only. None of the operative variables correlated with medical specialty PFPs.

Table 2 Operation and hernia characteristics of patients undergoing inpatient open ventral hernia repair that were associated with increased professional fee payments (PFPs)

All patients	$N = 283$ (100%)	Average 360-day PFPs in US dollars				
		Abdominal surgeon	Anesthesiology/ pain management	Medical specialties	Radiology	Other providers
		$2128	$604	$300	$205	$171
Emergent procedure	40 (14.1%)	1572**				343**
Transfer from other healthcare facility	25 (8.8%)	1506*				241**
Duration of operation, mins		***	*			
≤ 120	68 (24.0%)	1660	444			
121–180	97 (34.3%)	2151	551			
181–240	84 (29.7%)	2282	664			
241 +	34 (12.0%)	2621	930			
Total mesh cm^2	$n = 256$	***				
≤ 320	80 (31.3%)	1325				
321–840	88 (34.4%)	2032				
841+	88 (34.4%)	2588				
Mesh type		***				
None	35 (12.4%)	1474				
Synth	156 (55.1%)	1839				
Biol	59 (20.8%)	2686				
Absorb	33 (11.7%)	3192				
Separation of components	85 (30.0%)	3015***			295*	

Non-parametric tests of group differences significant at *$p < .05$; **$p < .01$; and ***$p < .001$

Several NSQIP 30-day complications increased medical specialty and radiology PFPs (Table 3). Pulmonary complications were strongly correlated with COPD (sevenfold risk, $p < .001$) and increased medical specialty payments by well over $2000. Sepsis/shock was associated with hematocrit < 38% (threefold risk, $p = .049$) and increased medical specialty payments by over $3000. Surgeon PFPs did not correlate with either COPD, HCT < 38%, sepsis or pulmonary complications. PFPs were elevated, but not significantly, given the small sample size for renal failure or insufficiency ($n = 4$) and acute myocardial infarction ($n = 4$). At 6 months post-operation, ongoing wound complications were associated with increased surgeon and radiology payments ($p < .01$).

Discussion

Comorbid conditions such as COPD and diabetes, known to influence complexity of patient management, post-operative resource requirements, and length of hospital stay do not influence surgeon reimbursement, nor do early complications, even severe ones such as sepsis and respiratory failure. A patient history of severe COPD in our data was associated with a seven-fold risk for postoperative pneumonia; low hematocrit increased risk for sepsis. Neither the conditions nor the associated complications resulted in increased payments to the surgeon. Patients with COPD having abdominal operations have been shown to have increased hospital length of stay, morbidity, and mortality compared to patients that do not have COPD [2]. Metabolic syndrome has been shown to be associated with longer hospitalizations and more complications, readmissions, and reoperations compared to patients without the risk factors [1]. Obesity is over-represented among the ventral hernia population as compared to the US population as a whole [15, 16], and is associated with increased risk of complications following VHR [3, 4]. We know comorbid conditions take time and money to care for, so the question is why is the surgeon the only person not reimbursed for their time?

These data highlight the effects of the standardized 90-day global fee payment implemented in the early 1990s as a result of the Omnibus Budget Reconciliation Act of 1989. It is noteworthy that part of the stated goals of that legislation was the relative reduction in procedural payments and increases in primary care payments [17]. At our institution, the phrases "work RVU volume," "productivity," and "throughput" have been linked for a while with "program investments" and "salaries/bonuses," often with but sometimes without "quality of care." Surgeons face a growing opportunity cost in caring for highly comorbid patients that affects them personally and their programs. One option is to deny acute transfers or referrals thereby limiting patient access but reducing hospital costs and decreasing reported program levels of morbidity and mortality. Another option, transferring comorbidity management to their medical specialty colleagues, has ensuing challenges to patient care coordination and handoffs and increased cost to payers. These pressures are amplified at tertiary referral centers like ours where acutely ill patients across the region are triaged to our doors. We suggest some form of comorbid risk adjustment to surgeon payments to alleviate these adverse pressures.

Bundled payment models are at the forefront of the national healthcare discussion, and it is important for architects of future healthcare models to be aware of the deficiencies and unforeseen consequences of payment bundling that surgeons have been wrangling with for a quarter of a century. Also, discussions need to recognize the long-standing bundling of surgical payments that already exist.

In conclusion, management of acute comorbid conditions and the associated higher early morbidity is unreimbursed to the surgeon, potentially pressuring busy surgeons to select against these patients. Surgeon reimbursement, unlike hospital reimbursement, does not have comorbid risk adjustment and it should to avoid these selection pressures. In negotiating bundled payments and other advanced payment models, surgeon groups should keep in mind that surgeon reimbursement, unlike medical and hospital reimbursement, has been bundled since the

Table 3 Increases in VHR professional fee payments by specialty for treatment of NSQIP 30-day complications

All patients	$N = 283$ (100%)	Average 360-day PFPs in US dollars			
		Abdominal surgeon	Medical specialties	Radiology	Other providers
		$2128	$300	$205	$171
Surgical site infection or dehiscence	48 (17.0%)			338***	298*
Pneumonia/reintubation/ventilation > 48 h	12 (4.2%)		2771***	453*	
Sepsis/shock	11 (3.9%)		3014**	590**	
Treated DVT or pulmonary embolism	6 (2.1%)		1186*	1069*	

Mann–Whitney U test for group differences: *$p < .05$; **$p < .01$; ***$p < .001$

90s, and vigorously defend what is an already constrained share of reimbursement.

Compliance with ethical standards

Disclosures Dr. Roth has consulting relationships with Bard, Allergan, and Miromatrix. He is a participant on a speaking bureau for Bard and Miromatrix. He has some stock ownership in Miromatrix. He receives research funding from Bard. Drs. Plymale, Davenport, and Hughes and Mr. Mirembo have no conflicts of interest or financial interests to disclose.

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