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Beth Israel Deaconess Medical Center

HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

Aspirin Use During Robotic Partial Nephrectomy is Associated with an Increased Likelihood of Bleeding Complications

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USPSTF Recommendations for Aspirin Use

- **Recommended** for primary prevention of cardiovascular disease (nonfatal MI, stroke) in 50-59 years old with a ≥10% 10 year CVD Risk
- Individualized decision in ages 60-69 with a ≥10% 10 year CVD Risk

Figure. Aspirin Use for the Primary Prevention of Cardiovascular Disease and Colorectal Cancer: Clinical Summary

Population	Adults aged 50 to 59 y with a ≥10% 10-y CVD risk	Adults aged 60 to 69 y with a ≥10% 10-y CVD risk	Adults younger than 50 y	Adults aged 70 y or older
Recommendation	Initiate low-dose aspirin use. Grade: B	The decision to initiate low-dose aspirin use is an individual one. Grade: C	No recommendation. Grade: I (insufficient evidence)	No recommendation. Grade: I (insufficient evidence)

https://www.uspreventiveservicestaskforce.org/

American College of Cardiology Recommendations

- 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease
  - **Considered** for primary prevention of ASCVD in select higher ASCVD adults aged 40-60 years old without increased bleeding risk
  - Low dose aspirin **recommended** for prevention of secondary ASCVD

1. J Am Coll Cardiol 2019; March 17
2. acc.org

Recommended aspirin use after cardiovascular intervention creates challenges for patients undergoing surgery

Perioperative Complications of Robot-assisted Partial Nephrectomy: Analysis of 886 Patients at 5 United States Centers

Youssef S. Tanagho, Jihad H. Kaouk, Mohamad E. Allaf, Craig G. Rogers, Michael D. Stifelman, Bartosz F. Kaczmarek, Shahab P. Hillyer, Jeffrey K. Mullins, Yichun Chiu, and Sam B. Bhayani

- Multi-institutional study of 5 US institutions
- Retrospective analysis of prospectively maintained database
- 886 patients underwent RPN from 2007-2011

Complication and bleeding risks after RPN

- Overall complication rate: 15.6%[1]
- Postoperative hemorrhage rate: 5.8%[1]
- Transfusion rate: 4.6% [1]
- To minimize risks of bleeding and complications, aspirin is often discontinued 5-7 days prior to surgery

Tanagho et al, Urology, 2012

Is perioperative aspirin safe for robotic partial nephrectomy?

Aspirin and clopidogrel during robotic partial nephrectomy, is it safe?

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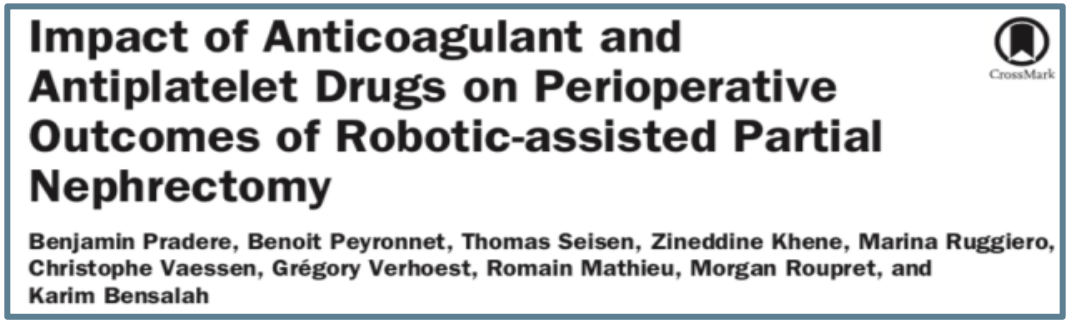
- Single institution retrospective study
- 6 patients underwent RPN
  - 4 patients remained on aspirin 81 mg during RPN surgery for high risk cardiovascular and cerebrovascular disease
  - 2 patients remained on aspirin 81 mg and clopidogrel for DES
- 33% overall complication rate
  - Clavien I (nausea), then readmission for postoperative bleed and transfusion after restarting warfarin

Althaus et al, Canadian Journal of Urology, 2015



- Retrospective study, 2 institutions
- 533 patients underwent robotic partial nephrectomy
  - 70 pts on AC, AP
  - 463 pts off AC, AP
- Patients on AC, AP were significantly associated with:
  - Higher risk of overall complications (39% vs 17%)
  - Increased major complications (19% vs 9.6%)
  - Hemorrhagic complications (33% vs 9.6%)
  - Transfusion rate (25% vs 10%)
  - Length of hospital stay (5 vs 3.9 days)

Pradere et al, J Urology, 2016

The Impact of Perioperative Aspirin on Bleeding Complications Following Robotic Partial Nephrectomy

Vignesh T. Packiam, MD, Charles U. Nottingham, MD, Andrew J. Cohen, MD, Shane M. Pearce, MD, Arieh L. Shalhav, MD, and Scott E. Eggener, MD

- Retrospective single institution review
- 214 patients:
  - 49 continued Aspirin 81 mg
  - 34 held aspirin 7 days prior to surgery
  - 131 never on aspirin
- No significant difference in bleeding risk
- Aspirin associated with:
  - Significant increase in 30 day overall complications
  - Increase in Clavien 3-4 complications
  - Increase in IR embolization

TABLE 4. POSTOPERATIVE COMPLICATIONS OF PATIENTS BY PERIOPERATIVE ASPIRIN (AMERICAN SOCIETY OF ANESTHESIOLOGISTS) ADMINISTRATION STATUS

	Continued ASA (n=49)	*Held ASA (n=34)*	*No prior ASA (n=131)*	p-*Value*
LOS, days (median [IQR])	1 [1, 2]	1 [1, 2]	1 [1, 2]	0.19
Bleeding complications, *n* (%)[a]	13 (27)	5 (15)	18 (14)	0.13
Hemoglobin drop >3 g	12 (24)	5 (15	18 (14)	0.24
Transfusion	2 (4)	1 (3)	2 (1.5)	0.43
IR embolization[b]	3 (6)	1 (3)	1 (0.8)	0.07
30-day complications, *n* (%)[c]	12 (24)	4 (12)	10 (8)	**0.03**
Clavien 1–2	7 (14)	2 (6%)	8 (6)	0.21
Wound infection			1 (0.8)	
Urinary tract infection		1 (3)	1 (0.8)	
Fever			1 (0.8)	
Atelectasis	1 (2)	1 (3)	1 (0.8)	
Pneumonia	1 (2)			
Pneumothorax	1 (2)			
Hypoxia	1 (2)			
Ileus			2 (1.5)	
Transfusion	2 (4)		2 (1.5)	
Retroperitoneal hematoma	1 (2)			
Clavien 3–4 (%)	5 (10)	2 (6)	2 (1.5)	**0.02**
IR embolization	3 (6)	1 (3)	1 (0.8)	
IR pneumothorax drainage			1 (0.8)	
Pacemaker insertion	1 (2)			
Reoperation for incisional hernia	1 (2)			
Altered mental status (ICU)		1 (3)		

Packlam et al, J Endourology, 2016

Limited contemporary data regarding robotic PARTIAL nephrectomy (RPN) and aspirin use

- Single or two institutions
- Low powered
- Includes concomitant use of antiplatelets

Study Design

- Retrospective analysis of prospectively maintained database
- 5 high volume RPN institutions
  - Beth Israel Deaconess Medical Center
  - Henry Ford
  - John Hopkins
  - Penn State
  - University of Florida
- 1566 RPN patients
  - Aspirin 81 mg vs no aspirin use
  - Aspirin was taken within 24 hours of surgery and continued postoperatively
- Primary outcome: Perioperative transfusion rate
- Secondary outcome: Bleeding related complication rate

Patient Characteristics

	Aspirin (n=229)	No Aspirin (n=1337)	Overall (n=1566)	p value
Sex (n, %) Male Female	 159 (69.4) 60 (30.6)	 765 (57.2) 572 (42.8)	 924 (59) 642 (41)	0.0007
Mean Age (range)	62.8 (32-88)	56.8 (17-84)	57.7 (17-88)	<0.0001
Mean RENAL score (range)	6.8 (4-11)	7.0 (4-12)	6.9 (4-12)	0.3791
Median Charlson Index (range)	3 (0-10)	2 (0-12)	2 (0-12)	<0.0001

Complications

	Aspirin (n=229)	No Aspirin (n=1337)	Overall (n=1566)	p value
30-day postop complication (n, %)	66 (29.1)	229 (17.3)	295 (19)	<0.0001
Minor complications (Clavien 1-2) (n, %)	43 (65.2)	178 (80.2)	221 (76.7)	0.02
Major complications (Clavien 3-5) (n, %)	23 (34.8)	44 (19.8)	67 (23.3)	0.02
Postop Bleeding Complications (n, %)	15 (6.6)	30 (2.2)	45 (2.9)	0.0007
Blood Transfusion (n, %)	14 (6.2)	33 (2.5)	47 (3)	0.0048

Relative Risk of Blood transfusion

	RR (All)	95% CI	RR (Females)	95% CI	RR (Males)	95% CI
Age	1.04	1.02-1.06	1.05	1.03-1.06	1.01	0.97-1.04
Aspirin*	1.61	1.12-2.32	3.39	1.48-7.78	1.16	0.74-1.81
CCI	1.05	0.95-1.17	0.87	0.7-1.08	1.25	0.99-1.57
RENAL	1.1	1.03-1.17	1.29	1.24-1.35	0.9	0.71-1.13
Pre-op Hb	0.73	0.64-0.82	0.72	0.64-0.8	0.63	0.47-0.84
Sex**	1.07	0.7-1.62				

*No aspirin used as reference
** Male used as reference

Conclusions

In this large, multi-institutional study, low dose perioperative aspirin during RPN is associated with higher rates of blood transfusion and bleeding complications.

Future Questions

- Is perioperative aspirin use associated with decreased postoperative cardiovascular and cardiocerebral events?
- How can we risk stratify patients undergoing RPN to determine the value of continuing perioperative anticoagulation?

Thank you!