

Femoral Nerve Catheters Decrease Opioid Related Side Effects and Increase Home Disposition Rates among Geriatric Hip Fracture Patients

D Arsoy M.D., M.S.

MJ Gardner, M.D.

DF Amanatullah, M.D., Ph.D.

Jl Huddleston, M.D.

SB Goodman, M.D., Ph.D.

MW Maloney, M.D.

JA Bishop, M.D.

Stanford University, School of Medicine, Palo Alto, CA

Geriatric proximal femur fractures

- ▶ Worldwide incidence on the rise
 - ▶ 289,000 hip fractures/year in the US by 2030
- ▶ Acute pain is important source of morbidity
 - ▶ Inadequate pain control
 - ▶ Increased complication rate
 - ▶ Pneumonia
 - ▶ DVT/PEs
 - ▶ Delayed mobilization



OPIOIDS

- ▶ Mainstay of acute pain treatment
- ▶ Clinically significant side effects
 - ▶ Nausea/Vomiting
 - ▶ Delirium
 - ▶ Respiratory depression
 - ▶ Delay of mobilization
- ▶ Increasing interest in minimizing narcotics



Important to minimize opioid intake

- ▶ Avoiding oral/parenteral narcotics
- ▶ Use of non-narcotic meds, i.e. NSAIDs/Tylenol
- ▶ Utilization of regional anesthesia
 - ▶ Spinal/Epidural
 - ▶ Selective nerve blocks

Femoral nerve catheters

- ▶ Lower pain scores
- ▶ Decreased morphine consumption
- ▶ Decreased side effects
- ▶ ? complications, LOS and mortality
- ▶ Effect on hospital discharge unknown



Outcomes/Purpose

- Pain scores & morphine consumption
- Opioid related side effects
- Discharge disposition

Retrospective historical control group – 1 yr

- ▶ Consecutive series
- ▶ Hip fracture patients >65 years old
- ▶ Standard Analgesia
- ▶ 149 patients

Femoral Catheter Protocol – 2 yrs

- ▶ Continuous femoral nerve catheter in ER
- ▶ Maintained through immediate post-op
- ▶ 116 patients

Femoral nerve catheters

- ▶ Placed by anesthesiologist trained in regional anesthesia
- ▶ Under US guidance
- ▶ Anesthesia of femoral/obturator/LFCN
- ▶ Bolus 0.1% ropivacaine; continuous 0.1% ropivacaine infusion at 8 ml/hour until POD#2
- ▶ Anesthesia team rounds daily while catheter in place



Exclusion = 123 patients

- ▶ Advanced dementia (54)
- ▶ Multiple extremities (10)
- ▶ High-energy mechanism (4)
- ▶ Chronic pain (3)
- ▶ Pathologic frx (2)
- ▶ In-hospital death (2)
- ▶ TBI (1)
- ▶ Single shot femoral block (9)
- ▶ Catheter removal due to incisional proximity (29)
- ▶ Catheter malfunction (9)

Outcome measurements

- ▶ Pre-/ Postop pain scores
- ▶ Morphine equivalent consumption
- ▶ Opioid related side effects
 - ▶ PONV
 - ▶ Urinary retention
 - ▶ Ileus
 - ▶ Respiratory depression
 - ▶ Delirium

Demographics

Parameters	Block (n=116)	SA (n=149)	P Value
Sex, n(%)			
Female	86 (74%)	110 (73%)	0.954
Male	30 (26%)	39 (26%)	
Age (years) , mean (SD)	84.9 (8)	83.4 (8.3)	0.864
ASA, mean (SD)	2.7 (0.6)	2.9 (0.6)	0.132
Length Hospital Stay (days), mean (SD)	4.7 (2.5)	4.5 (1.9)	0.819
Treatment, n(%)			
Internal Fixation Arthroplasty	66 (57%) 50 (43%)	99 (66%) 50 (34%)	0.112

Pain Scores

Pain scores	Block (N=116)	Standard (N=149)	P Value
All			
Preoperative	1.9±1.7	4.7±2	<0.0001
POD#1	1.5±1.6	3±1.7	<0.0001
POD#2	1.2±1.5	2.6±2.1	<0.0001
Arthroplasty			
Preoperative	1.7±1.7	4.4±1.8	<0.0001
POD#1	1.2±1.5	3±1.7	<0.0001
POD#2	1±1.2	2.5±2	<0.0001
Internal Fixation			
Preoperative	2.1±1.7	4.7±2	<0.0001
POD#1	1.7±1.6	2.9±1.7	<0.0001
POD#2	1.4±1.8	2.3±2	0.0035

Morphine consumption

Morphine equivalent consumption (mg)	Block (N=116)	Standard (N=149)	P Value
All			
POD#1	4.4±5.8	7.2±10.8	0.006
POD#2	3.4±4.4	6.8±13	0.105
Arthroplasty			
POD#1	3.9±5.1	6.2±7.5	0.043
POD#2	3.2±4.4	5.3±11.9	0.322
Internal Fixation			
POD#1	4.8±6.3	7.3±11.6	0.601
POD#2	3.5±4.4	6.8±12.5	0.194

Opioid related side effects

Parameters	Block (N=116)	Standard (N=149)	P Value
Overall rate, n(%)	32/116 (27.5%)	70/149 (47%)	0.001
PONV, n(%)	6/116 (5.2%)	23/149 (15.4%)	0.009
Urinary retention, n(%)	7/116 (6%)	14/149 (9.4%)	0.366
Ileus, n(%)	0 (0%)	2/149 (1.3%)	0.506
Respiratory depression, n(%)	2/116 (1.7%)	4/149 (2.7%)	0.697
Delirium, n(%)	17/116 (14.7%)	27/149 (18.1%)	0.508

Disposition

Parameters	Block (n=116)	Standard (n=149)	P Value
Disposition			
HHS	17 (15%)	9 (6%)	0.046
SNF	99 (85%)	139 (93%)	
Expired in hospital	0 (0%)	1 (1%)	

THA Pain Scores/Morphine consumption

	Block (N=14)	Standard (N=15)	P Value
Pain scores			
Preoperative	1.9±1.4	4.9±1.5	<0.0001
POD#1	1.6±1.2	3.2±1.6	0.005
POD#2	1.8±1.3	2.9±1.4	0.037
Morphine consumption (mg)			
Preoperative	3.2±2.6	8.3±5.5	0.007
POD#1	6.7±7	7.4±7.2	0.631
POD#2	6.2±1.3	13±22	0.711

THA Opioid related side effects/Disposition

Parameters	Block (n=14)	Standard (n=15)	P Value
Overall rate, n(%)	1 (7.1%)	(15) 47%	0.001
Disposition, HHS	6 (43%)	1 (7%)	0.023
SNF	8 (57%)	14(93%)	

LIMITATIONS

- ▶ Retrospective
- ▶ No standardized block protocol
- ▶ Difficult to assess demented patients

CONCLUSION

- ▶ After initiation of block protocol
 - ▶ decreased pain scores
 - ▶ decreased morphine consumption
 - ▶ decreased opioid related side effects
 - ▶ more patients went home

Thank
you

