NYU Langone Health

Division of General Surgery

Concomitant Gynecologic Procedures During Ventral Hernia Repair: Propensity Score Matched Analysis using the ACHQC Database

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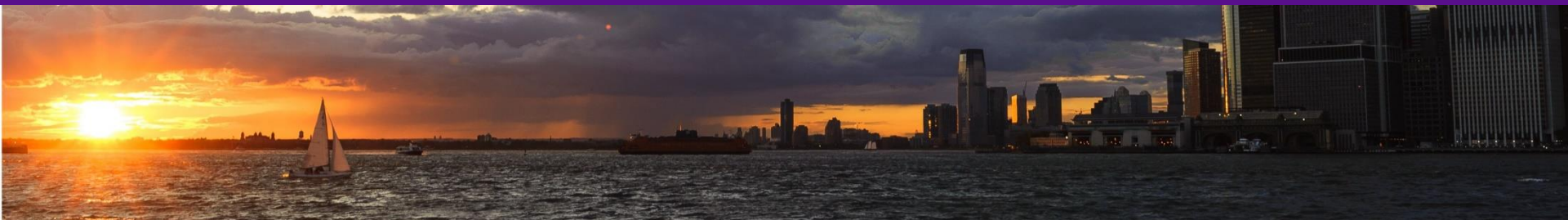
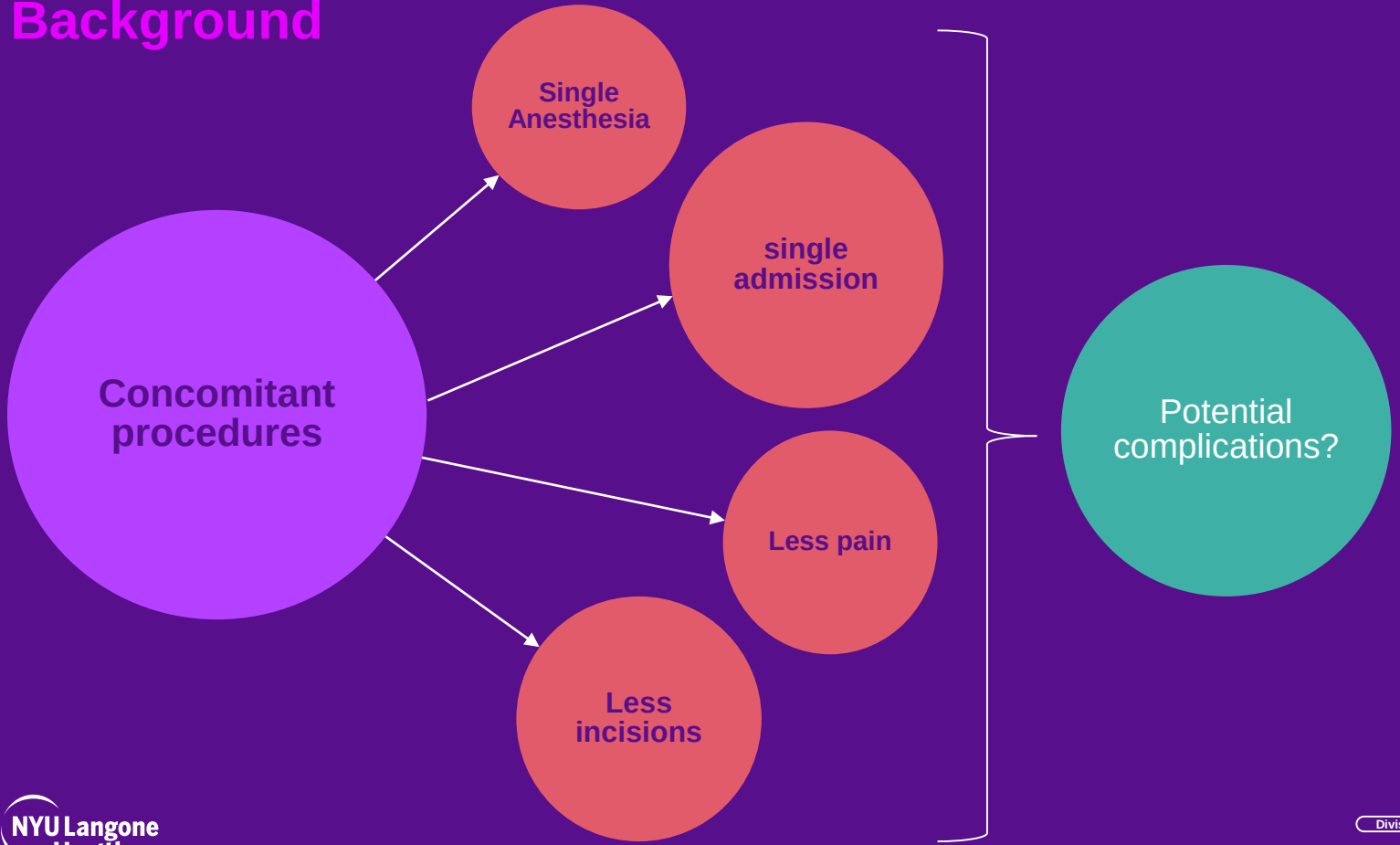


Disclosures

FM: consultant for Intuitive, Medtronic, BD, Integra, Allergan and DeepBlue

Background


Concomitant procedures
Single Anesthesia
single admission
Less pain
Less incisions
Potential complications?

Background

ORIGINAL ARTICLE

Repair of umbilical hernias concomitant to other procedures is safe: a propensity score-matched database study

B. Hegstad[1,2] · T. K. Jensen[1] · F. Helgstrand[3] · N. A. Henriksen[1]

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Full Reports

Concomitant Laparoscopic Intraperitoneal Onlay Mesh Repair with Other Clean Contaminated Procedures—Study of Feasibility and Safety

Palanivelu Praveen Raj, MS, DNB (Gen Surg), DNB (Surg Gastro), Meesabile K. Ganesh, MS, Palanisamy Senthilnathan, MS, DNB, MRCS, FACS, Ramakrishnan Parthasarathi, MS, Subbiah Rajapandian, MS, FRCS, and Chinnusamy Palanivelu, MS, MCh, FRCS, FACS

Outcomes of Concurrent Ventral Hernia Repair and Cholecystectomy Compared to Ventral Hernia Repair Alone

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Surg Endosc (2018) 32:1915–1922
DOI 10.1007/s00464-017-5884-3

Concomitant open ventral hernia repair: what is the financial impact of performing open ventral hernia with other abdominal procedures concomitantly?

Vashisht Madabhushi[1] · Margaret A. Plymale[1] · John Scott Roth[1,4] · Sara Johnson[3] · Alex Wade[3] · Daniel L. Davenport[2]

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2019 SSAT PLENARY PRESENTATION

Concurrent Laparoscopic Ventral Hernia Repair with Bariatric Surgery: a Propensity-Matched Analysis

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Outcomes of concomitant ventral hernia repair performed during bariatric surgery

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Objective

To compare **30-day outcomes** amongst patients undergoing **ventral hernia repair** (VHR) and patients undergoing **VHR and a combined gynecological procedure** using the **ACHQC database**

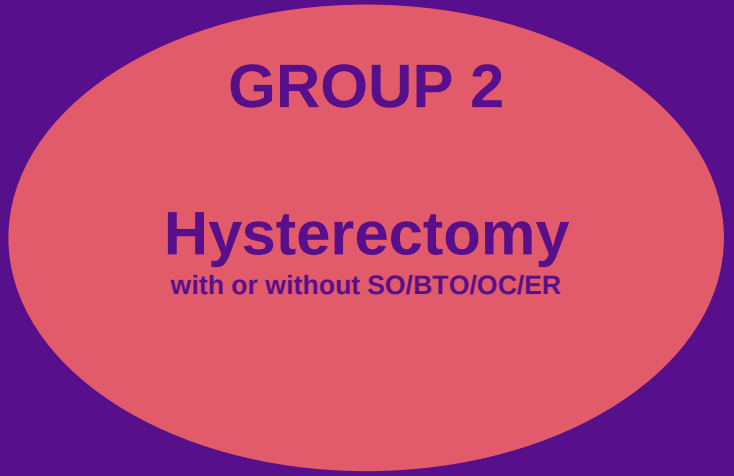
Inclusion criteria

- **Adult patients**
- **Female**
- **Between 2014 and 2023**
- **Ventral hernia repair**
- **Concomitant gynecological procedure**
- **30 day follow up completed**

Methods

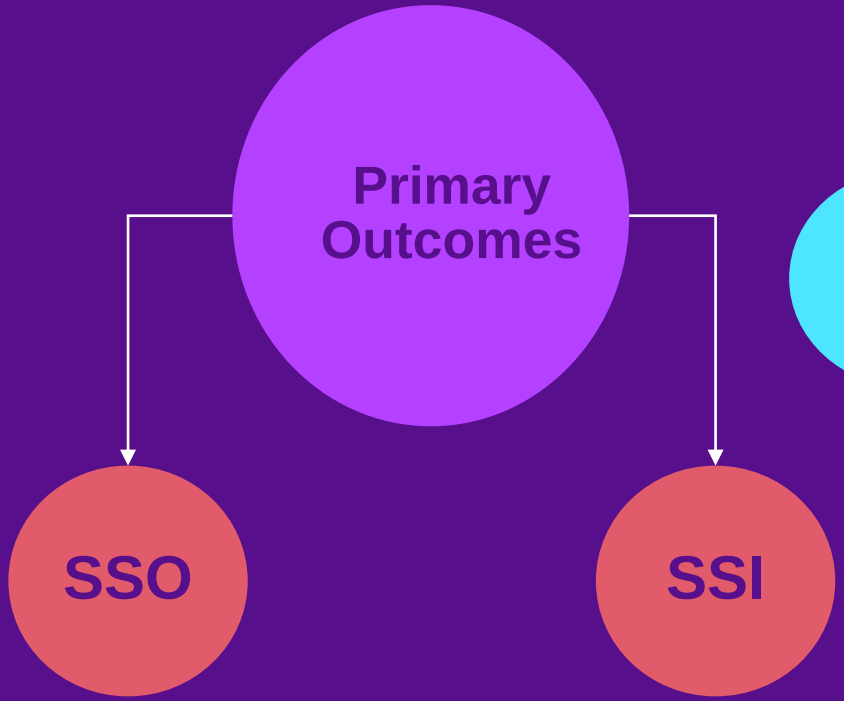
Patients were categorized into two groups:

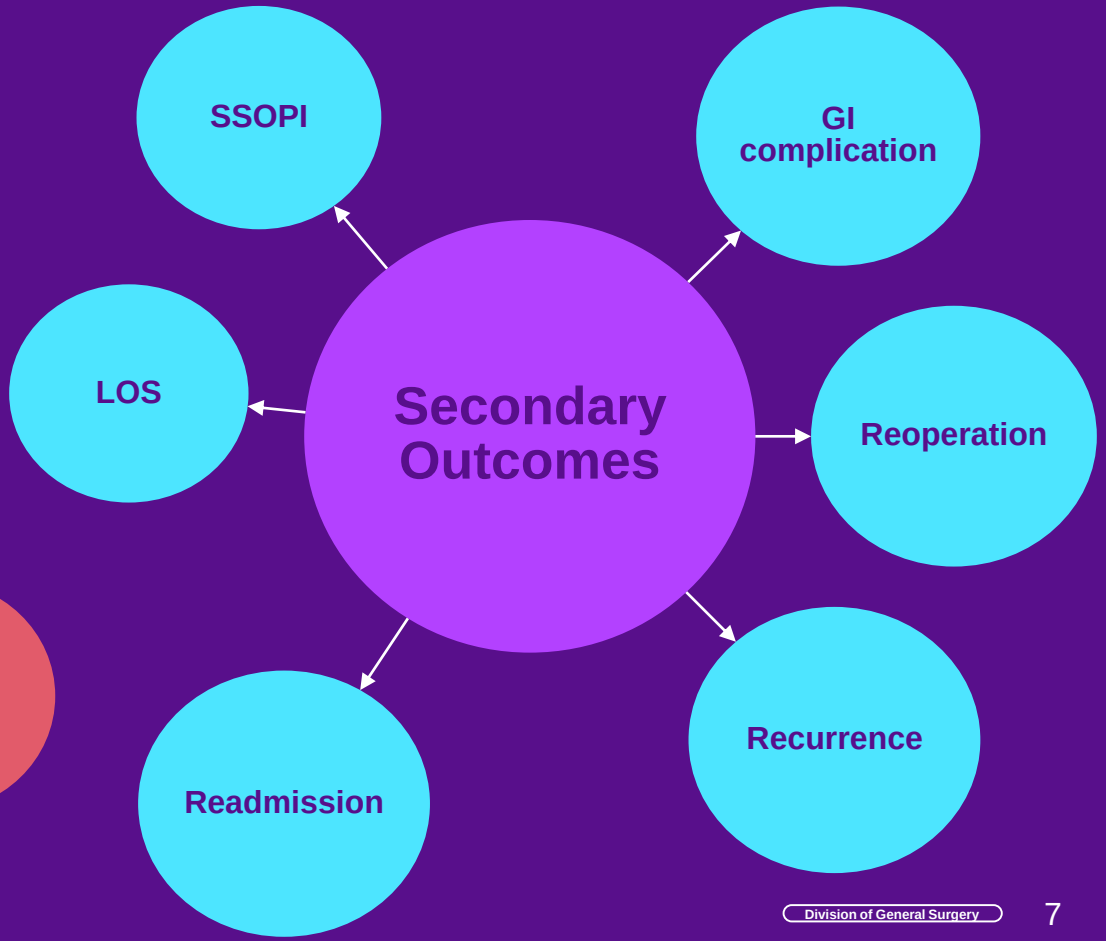
Clean



Clean Contaminated

Methods


Primary Outcomes
SSO
SSI

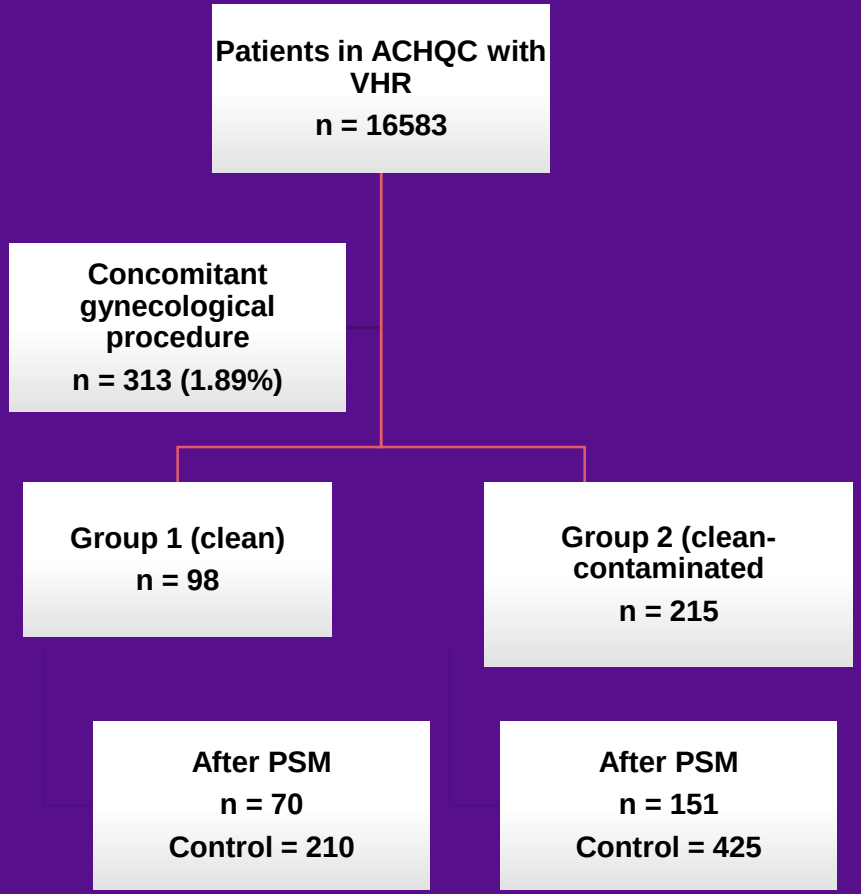

Secondary Outcomes
SSOPI
GI complication
LOS
Reoperation
Readmission
Recurrence

Propensity Score Matching

Matched for relevant demographics and perioperative variables.

- **Age**
- **Sex**
- **BMI**
- **Elective vs emergency**
- **Recurrent hernia**
- **Hernia width**
- **Primary Indication**
- **Bowel obstruction**
- **Wound status**

Results


Patients in ACHQC with VHR
n = 16583
Concomitant gynecological procedure
n = 313 (1.89%)
Group 1 (clean)
n = 98
Group 2 (clean-contaminated
n = 215
After PSM
n = 70
Control = 210
After PSM
n = 151
Control = 425

Demographic characteristics for unmatched, PSM Group 1, and PSM Group 2

	Group 1	Group 2	Control	*p*	Group 1	Control	*p*	Group 2	Control	*p*
Female %(n)	**100 (98)**	**100 (215)**	**100 (16270)**	**-**	**100 (70)**	**100 (210)**	**-**	**100 (151)**	**100 (425)**	**-**
Race										
White	71 (70)	66 (141)	79 (12909)	<0.001	71 (50)	78 (164)	0.3	69 (104)	78 (331)	0.03
Non-White	29 (28)	34 (74)	21 (3361)		29 (20)	22 (46)		31 (47)	22 (94)	
Age, median	42.5	50.0	56.0		52.0	50.5		50.0	52.0	
IQR	(37.0, 61.0)	(43.0, 59.0)	(44.0, 66.0)		(38.0, 63.7)	(42.25, 62.0)		(44.0, 60.0)	(42.0, 61.0)	
18-49.9, % (n)	57 (56)	48 (104)	36 (5880)	<0.001	49 (34)	46 (97)	0.5	44 (67)	43 (182)	0.5
50-59.9, % (n)	15 (15)	28 (60)	22 (3654)		17 (12)	23 (49)		29 (44)	26 (111)	
≥ 60, % (n)	28 (27)	24 (51)	41 (6925)		34 (24)	30 (64)		26 (40)	31 (132)	
BMI										
Median	33.8	34.2	31.4	<0.001	35.8	36.2	0.6	35.4	34.9	0.5
IQR	(28.5, 39.2)	(28.3, 41.0)	(26.6, 38.5)		(31.1, 40.4)	(30.4, 40.9)		(30.1, 41.7)	(30.3, 41.0)	
Comorbidities, % (n)										
Hypertension	33 (32)	44 (95)	43 (6925)	0.12	41 (29)	45 (95)	0.6	49 (74)	40 (169)	0.048
Diabetes	17 (17)	25 (53)	17 (2817)	0.019	20 (14)	22 (46)	0.7	28 (43)	21 (88)	0.05
COPD	1.0 (1)	2.8 (6)	5.4 (885)	0.037	0	4.3 (9)	0.12	2.6 (4)	6.1 (26)	0.10
Smoking Status, % (n)	11 (11)	8.8 (19)	9.9 (1613)	0.9	14 (10)	14 (30)	0.045	9.9 (15)	8.9 (38)	0.03
Never	78 (76)	73 (156)	68 (11004)		77 (54)	62 (131)		74 (111)	65 (278)	
ASA, % (n)										
1	11 (11)	5.1 (11)	9.5 (1549)	0.13	5.7 (4)	6.2 (13)	>0.9	2.0 (3)	1.6 (7)	0.5
2	48 (47)	43 (92)	43 (6917)		44 (31)	40 (85)		38 (58)	44 (185)	
3	41 (40)	52 (112)	48 (7801)		50 (35)	53 (112)		60 (90)	55 (233)	

Demographic characteristics for unmatched, PSM Group 1, and PSM Group 2

	Group 1	Group 2	Control	*p*	Group 1	Control	*p*	Group 2	Control	*p*
Insurance, % (n)										
Private	52 (51)	64 (134)	50 (8018)	-	51 (36)	55 (114)	0.6	67 (99)	52 (215)	0.013
Medicare	17 (17)	19 (41)	31 (4912)		20 (14)	22 (46)		20 (29)	25 (106)	
Medicaid	20 (20)	10 (22)	11 (1805)		16 (11)	15 (31)		8.2 (12)	16 (65)	
Surgeon affiliation, % (n)										
Academic	73 (72)	76 (163)	67 (10873)	0.02	80 (56)	67 (140)	0.062	74 (111)	74 (315)	0.2
Private	20 (20)	18 (39)	22 (3603)		16 (11)	20 (43)		21 (31)	16 (69)	
Functional status, % (n)										
Independent	100 (97)	99 (212)	97 (15,782)		100 (70)	96 (201)		98 (148)	95 (405)	
Partially dependent	0 (0)	0.9 (2)	1.7 (279)	0.2	0 (0)	1.9 (4)	0.3	1.3 (2)	3.1 (13)	0.7
Totally dependent	0 (0)	0 (0)	0.1 (23)		0 (0)	0 (0)		0 (0)	0.5 (2)	
Unkown	0 (0)	0.5 (1)	0.8 (133)		0 (0)	2.4 (5)		0.7 (1)	1.2 (5)	
Year of surgery, % (n)										
2012- 2017	28 (27)	35 (75)	35 (5766)	0.3	26 (18)	40 (84)	0.031	34 (51)	46 (196)	0.008
2018- 2022	72 (71)	65 (140)	65 (10504)		74 (52)	60 (126)		66 (100)	54 (229)	

Operative and hernia characteristics for unmatched, PSM Group 1, and PSM Group 2

	Group 1	Group 2	Control	*p*	Group 1	Control	*p*	Group 2	Control	*p*
Operative time, % (n)										
0-59 min	18 (18)	7.4 (16)	25 (4080)		2.9 (2)	13 (27)		2.6 (4)	7.8 (33)	
60-119 min	24 (24)	14 (31)	28 (4479)		26 (18)	29 (60)		13 (19)	22 (93)	
120-179	26 (25)	23 (49)	20 (3300)	<0.001	29 (20)	24 (51)	0.13	19 (28)	24 (100)	<0.001
180-239	12 (12)	19 (41)	13 (2102)		17 (12)	11 (24)		21 (32)	16 (66)	
>240	19 (19)	36 (78)	14 (2309)		26 (18)	23 (48)		45 (68)	31 (133)	
Wound status, % (n)										
Clean	79 (77)	34 (73)	92 (15015)	<0.001	73 (51)	75 (157)	0.8	32 (48)	36 (152)	<0.04
Clean-contaminated	21 (21)	66 (142)	7.7 (1253)		27 (19)	25 (53)		68 (103)	64 (273)	
Hernia Type, % (n)										
Incisional	56 (55)	67 (144)	69 (11285)	0.014	70 (49)	80 (167)	0.10	81 (122)	76 (323)	0.2
Umbilical	37 (36)	29 (63)	21 (3433)	<0.001	23 (16)	11 (24)	0.018	19 (29)	11 (48)	0.014
Epigastric	10 (10)	7.0 (15)	8.9 (1455)	0.5	10 (7)	5.7 (12)	0.3	4.0 (6)	5.4 (23)	0.5
Parastomal	1.0 (1)	0.5 (1)	3.6 (588)	0.008	1.4 (1)	6.2 (13)	0.3	0.7 (1)	16 (69)	<0.001
Spigelian	0	0.5 (1)	0.6 (100)	>0.9	0	1.0 (2)	>0.9	0.7 (1)	0	0.3

Operative and hernia characteristics for unmatched, PSM Group 1, and PSM Group 2

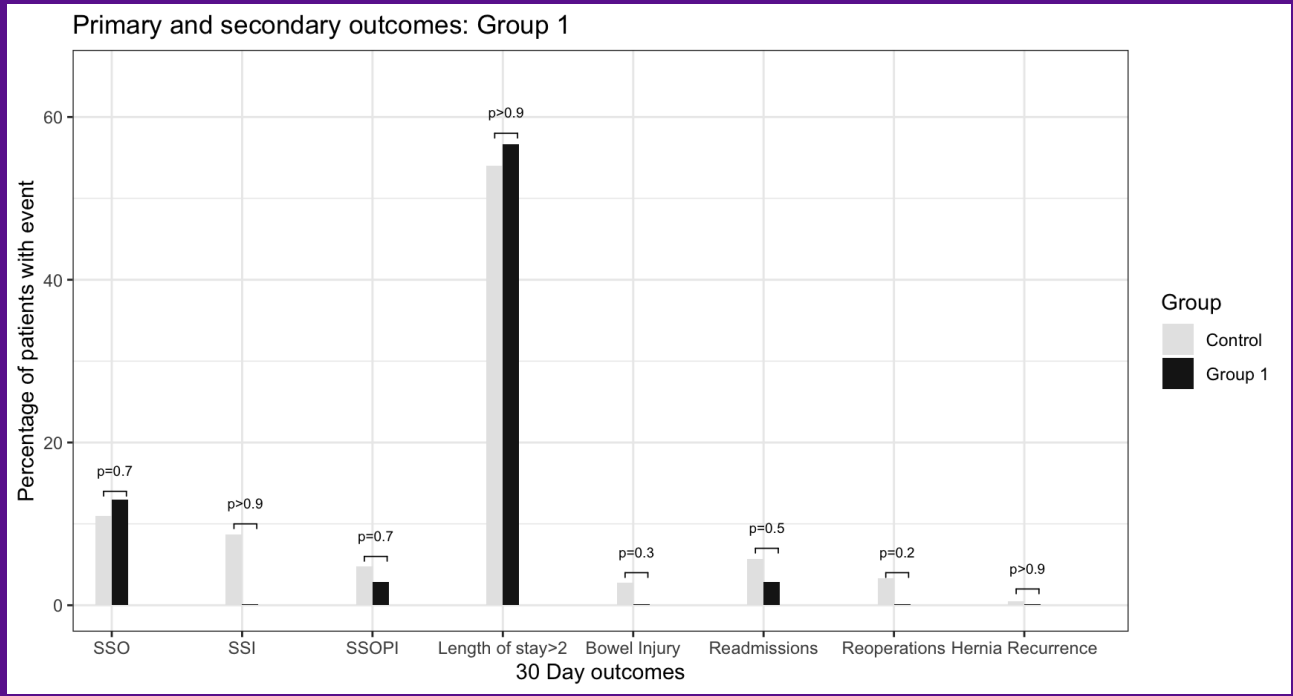
	Group 1	Group 2	Control	*p*	Group 1	Control	*p*	Group 2	Control	*p*
Recurrent Hernia, % (n)	24 (24)	23 (49)	28 (4577)	0.2	33 (23)	32 (67)	0.9	27 (41)	26 (110)	0.8
Approach,% (n)										
Laparoscopic	17 (17)	9.3 (20)	13 (2,127)	-	24 (17)	27 (56)	0.8	8.6 (13)	8.0 (34)	>0.9
Open	62 (61)	74 (160)	59% (9,582)		50 (35)	46 (96)		70 (106)	71 (302)	
Robotic	20 (20)	16 (35)	28% (4,560)		26 (18)	28 (58)		21 (32)	21 (89)	
Hernia width, median (IQR)	3.0 (1.5, 10.0)	4.0 (2.0, 8.0)	4.0 (2.0, 9.0)	0.3	6.0 (2.0, 12.5)	5.0 (3.0, 10.0)	>0.9	5.0 (3.0, 10.0)	6.0 (3.0, 10.0)	0.8
<4cm, % (n)	52 (51)	43 (93)	42 (6720)		37 (26)	30 (62)		30 (45)	28 (119)	
4-10cm, % (n)	21 (21)	36 (78)	35 (5722)	0.049	29 (20)	44 (93)	0.067	44 (66)	38 (163)	0.3
≥10cm, % (n)	27 (26)	20 (43)	23 (3742)		34 (24)	26 (55)		26 (240)	34 (143)	
Mesh used, % (n)										
Permanent	94 (67)	81 (126)	95 (13315)	-	94 (66)	97 (203)	0.5	81 (122)	81 (345)	0.028
Resorbable	4.2 (3)	14 (22)	3.1 (433)		4.3 (3)	2.9 (6)		15 (22)	8.9 (38)	
Biological	1.4 (1)	5.1 (8)	2.1 (296)		1.4 (1)	0.5 (1)		4.6 (7)	9.9 (42)	
Mesh location, % (n)										
Onlay	94 (67)	7.1 (11)	6.9 (972)	-	5.7 (4)	6.7 (14)	0.7	7.3 (11)	12 (51)	0.77
Inlay	4.2 (3)	1.9 (3)	2.5 (350)		2.9 (2)	1.4 (3)		2.0 (3)	4.7 (20)	
Sublay	90 (64)	91 (142)	91 (12723)		91 (64)	92 (193)		91 (137)	83 (353)	

Outcomes at 30 days for Unmatched Groups and Control, PSM Group 1, and PSM Group 2

	Group 1	Group 2	Control	*p*	Group 1	Control	*p*	Group 2	Control	*p*
SSO, % (n)	9.2 (9)	12 (25)	9.4 (1,524)	0.5	13 (9)	11 (23)	0.7	14 (21)	15 (64)	0.7
Seroma	44 (4)	44 (11)	54 (821)	0.6	44 (4)	39 (9)	>0.9	48 (10)	43 (27)	0.7
Hematoma	0 (0)	4.0 (1)	7.0 (107)	>0.9	0 (0)	4.3 (1)	>0.9	0 (0)	7.9 (5)	0.3
Ischemia	0 (0)	8.0 (2)	4.0 (61)	0.5	4.3 (3)	4.8 (10)	>0.9	9.5 (2)	4.8 (3)	0.6
SSI, % (n)	4.1 (4)	3.7 (8)	3.0 (484)	0.5	0 (0)	8.7 (2)	>0.9	4.6 (7)	5.9 (25)	0.6
Superficial	3.1 (3)	2.3 (5)	2.1 (339)	0.6	2.9 (2)	3.8 (8)	>0.9	2.7 (4)	2.4 (10)	0.8
Deep	1.0 (1)	0.9 (2)	0.9 (145)	0.7	1.4 (1)	0 (0)	0.3	1.3 (2)	3.3 (14)	0.3
Organ space	0 (0)	0 (0)	0.1 (18)	>0.9	0 (0)	1.0 (2)	>0.9	0 (0)	0.5 (2)	>0.9
Length of stay, median (IQR)	1.0 (0.0, 3.0)	2.0 (1.0, 4.0)	1.0 (0.0, 3.0)	<0.001	2.0 (0.0, 4.0)	1.0 (0.0, 4.0)	>0.9	2.0 (1.0, 4.0)	3.0 (1.0, 5.0)	0.2
1, % (n)	27 (13)	34 (61)	22 (1,994)		24 (11)	27 (39)		32 (43)	11 (36)	
2, % (n)	20 (10)	17 (30)	16 (1,419)		20 (9)	18 (26)		15 (20)	12 (39)	
3, % (n)	8.2 (4)	15 (27)	16 (1,449)	0.017	8.7 (4)	15 (21)	0.6	14 (19)	14 (45)	<0.001
4, % (n)	18 (9)	12 (21)	14 (1,219)		20 (9)	11 (16)		13 (18)	17 (55)	
≥5, % (n)	27 (13)	23 (42)	32 (2,797)		28 (13)	28 (40)		0 (0)	0 (0)	
SSO/SSI, % (n)	4.1 (4)	3.7 (8)	3.9 (636)	>0.9	5.7 (4)	5.2 (11)	>0.9	4.0 (6)	8.9 (38)	0.048
SSOPI, % (n)	2.0 (2)	1.4 (3)	2.6 (416)	0.6	2.9 (2)	4.8 (10)	0.7	1.3 (2)	5.4 (23)	0.034
Readmission, % (n)	3.1 (3)	5.1 (11)	3.8 (616)	0.5	2.9 (2)	5.7 (12)	0.5	6.0 (9)	8.0 (34)	0.4
Reoperation, % (n)	1.0 (1)	1.9 (4)	1.5 (243)	0.9	0 (0)	3.3 (7)	0.2	2.6 (4)	3.3 (14)	>0.9
Hernia recurrence, % (n)	0 (0)	0 (0)	0.2 (35)	>0.9	0 (0)	0.5 (1)	>0.9	0 (0)	0.5 (2)	>0.9

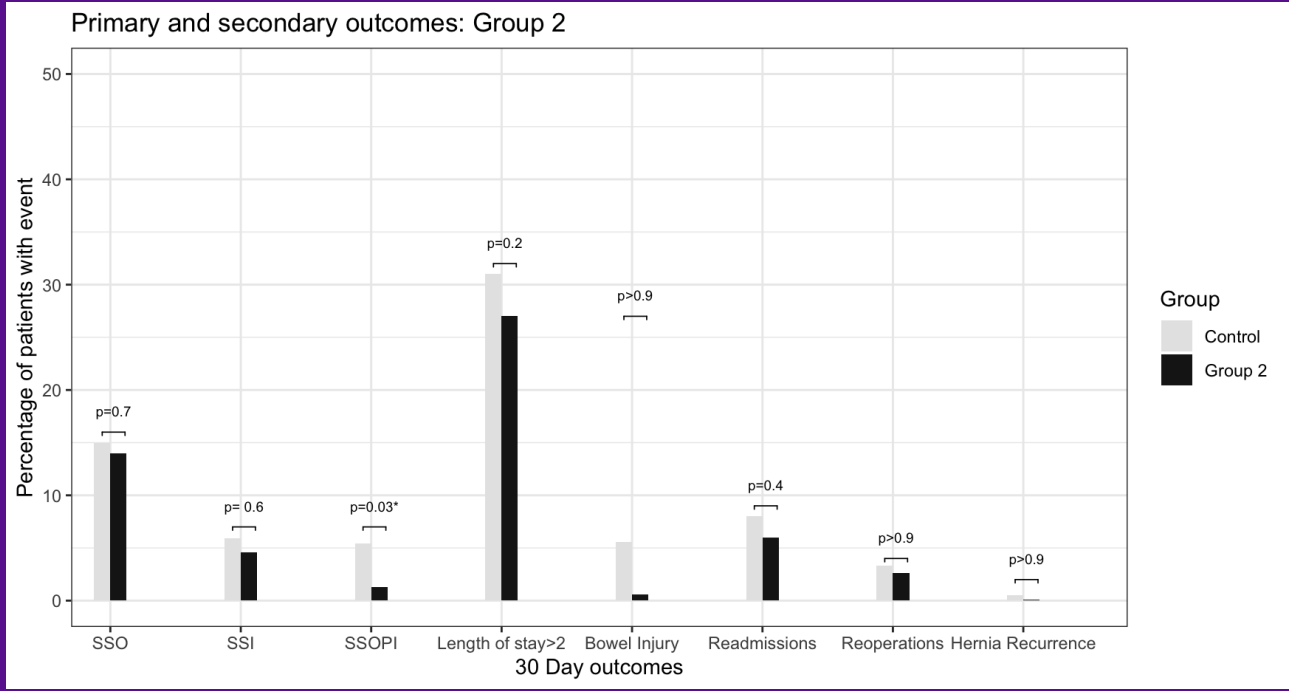
Primary and secondary outcomes at day 30: Group 1

- **No difference in outcomes between patients undergoing VHR and VHR + SO/BTO/OC/ER**
- More complications in VHR alone: SSI (0% vs 8.7%), SSOPI (2.9% vs 4.8%), Bowel Injury (0% vs 2.8%), Readmissions (2.9% vs 5.7%), Reoperations (0% vs 3.3%) and Hernia recurrence (0% vs 0.5%)
- More patients stayed more than 2 days (56.7% vs 54%) and had more SSO (13% vs 11%) than control.



Primary and secondary outcomes at day 30: Group 2

- Only statistically significant variable is SSOPI
- More complications in VHR alone: SSO (14% vs 15%), SSI (4.9% vs 5.9%), SSOPI (2% vs 10%), readmissions (9% vs 34%), reoperations (4% vs 14%) and hernia recurrence (0% vs 2%)



Conclusions

- Patients undergoing combined hernia repair and gynecologic surgery did not demonstrate inferior surgical outcomes compared to single VHR.

- Combined surgeries are an effective strategy for managing concurrent GYN pathologies & hernias.

Limitations

- Retrospective data
- Potential Reporting Bias
- Variability in surgical techniques
- No granularity about coated meshes
- Limited 30-day follow up

NYU Langone Health

Thank you

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Division of General Surgery