



Combined Inguinal and Ventral Hernia Repair

Can we create an Algorithmic Approach?

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NYULH Abdominal Core Health & Hernia Program

Disclosures

Tulio Brasileiro Silva Pacheco, Katherine Cordero Bermudez, Luis Arias-Espinosa and Joshua C. Hurwitz have no conflicts of interest or financial ties to disclose.

David Halpern MD, discloses consulting for Intuitive and Allergan, without conflict to this presentation.

Flavio Malcher MD, discloses consulting fees from BD, Intuitive, Integra, Deep Blue, Allergan, and Medtronic without conflict with this presentation.

Combined Inguinal and Ventral Hernia Repair

- VHR and IHR Guidelines available (Incisional Hernia Guidelines 2018 & 2023).
- Different options available for combined repair without clear guidelines and limited publications.
- Algorithm developed by the directors of program with 4 treatments groups.
- Demographics, comorbidities, operative ACHQC registry from November 2021



Update of the international HerniaSurge guidelines for groin hernia management

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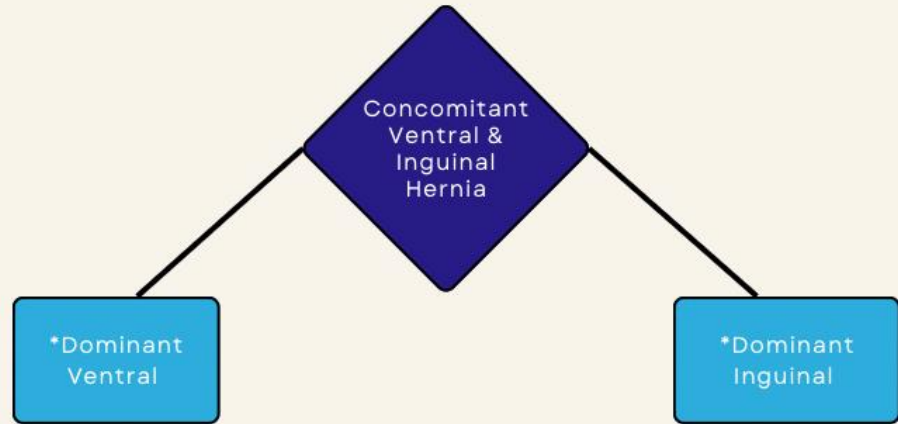
Midline incisional hernia guidelines: the European Hernia Society

David L. Sanders^{1,2}, Maciej M. Pawlak^{1,2}, Maarten P. Simons³, Theo Aufenacker⁴, Andrea Balla⁵, Cigdem Berger⁶, Frederik Berrevoet⁷, Andrew C. de Beaux⁸, Barbara East⁹, Nadia A. Henriksen¹⁰, Miloslav Klugar¹¹, Alena Langaufová¹¹, Marc Miserez¹², Salvador Morales-Conde¹³, Agneta Montgomerly^{14,15}, Patrik K. Pettersson^{14,15}, Wolfgang Reinhold⁶, Yohann Renard¹⁶, Simona Slezáková¹⁴, Thomas Whitehead-Clarke¹⁷ and Cesare Stabili^{18,19}

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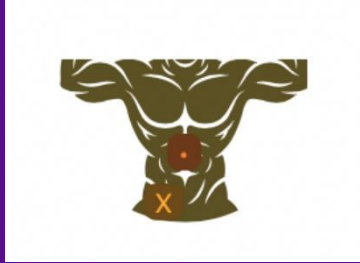
Dominant Hernia

Key Concept
Guiding our algorithm
approach

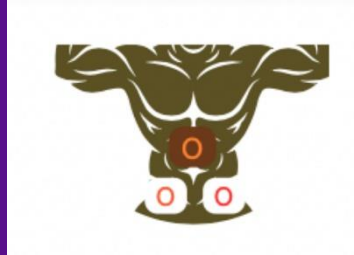


*Predominant Sx or which hernia is larger or more complex

4 Surgical Treatment Groups



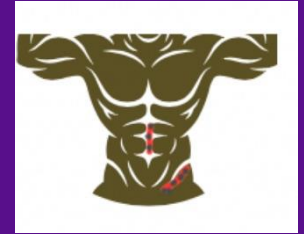
Group 1
Open VHR and MIS IHR
1A Open VHR and lap TEP IHR. (Suture repair or Mesh reinforcement)
1B Open VHR and Robotic transabdominal preperitoneal (TAPP) IHR. (Suture repair or Mesh reinforcement)



Group 2
Robotic TAPP VHR and IHR
2A Single upper dock
2B Lateral dock for the VHR with upper redocking for IHR (Double dock)

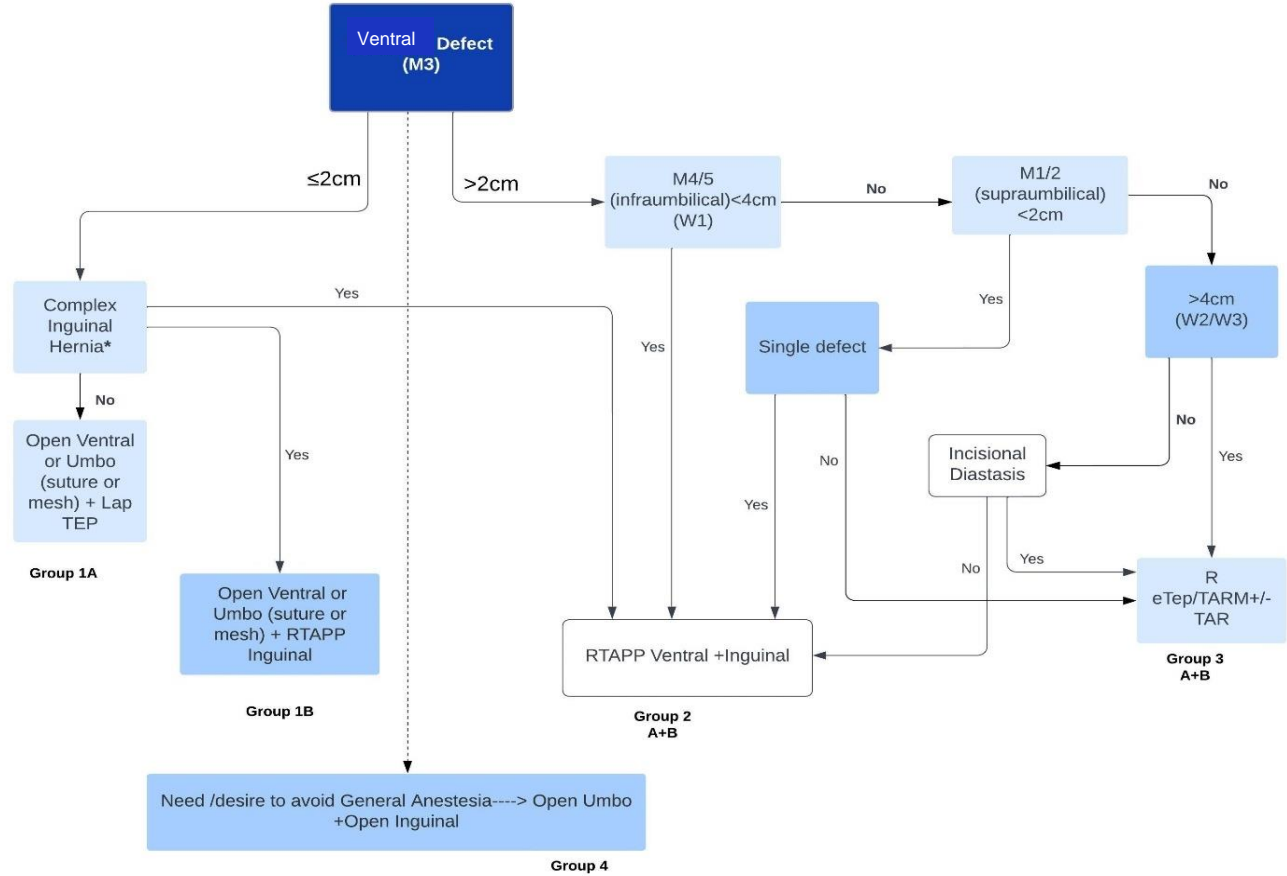


Group 3
Robotic retro-muscular VHR and IHR
3A Limited to retro-rectus space, in between semilunar lines(eTEP/TARM)
3B Included TAR



Group 4
Open VHR and IHR

Algorithm Dominant Ventral

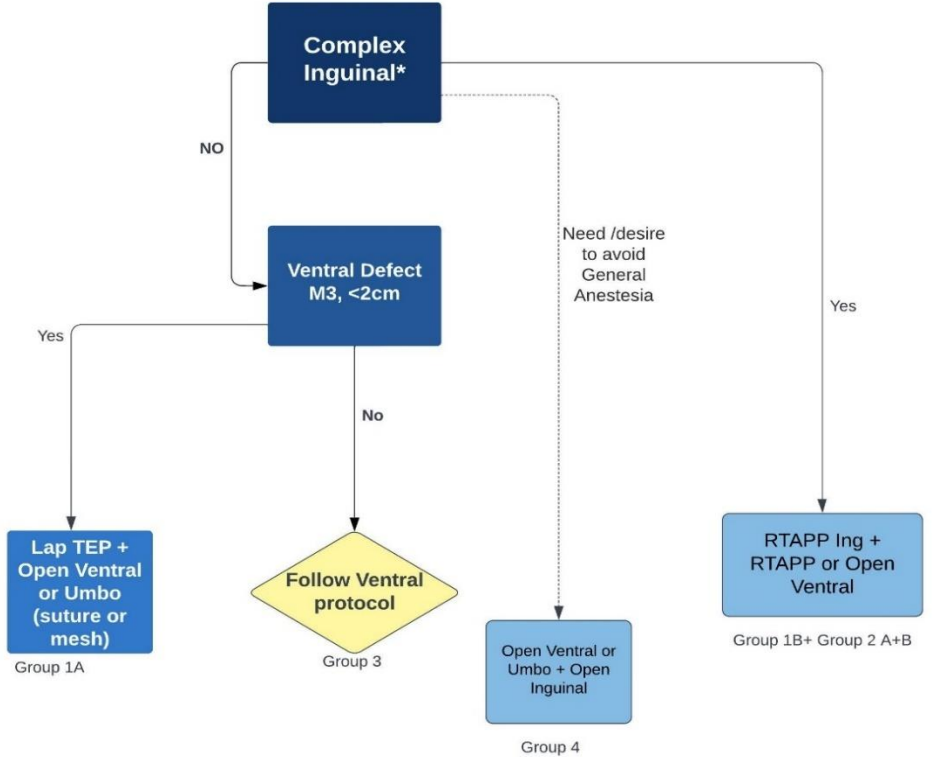


*Recurrent, M3/L3 (inguinal scrotal), prior pelvic or preperitoneal (PP) surgery

Algorithm Dominant Inguinal

Complex Inguinal Hernia

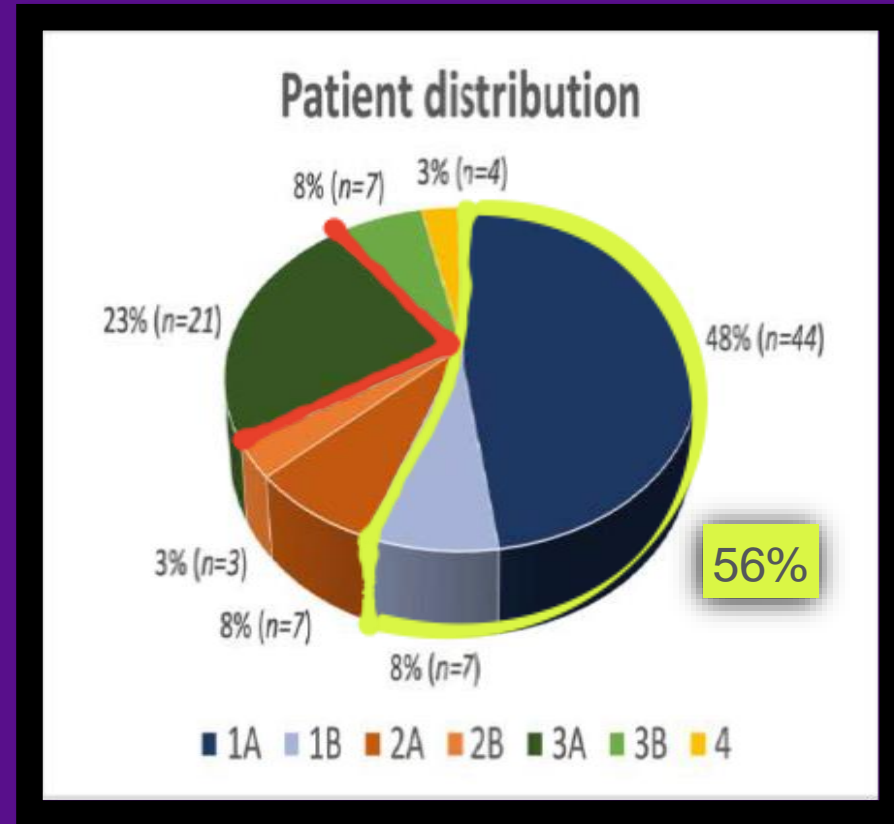
- Recurrent
- M3, L3 (inguinal scrotal)
- Previous mesh
- Previous pelvic surgery
- Short umbilical-pubic space



*Recurrent, M3, L3
(Inguinal scrotal)
prior pelvic or preperitoneal surgery

Results

- Total 135 patients in response to the ACHQC Query
- Excluded:
 - ✓ 33 pts records and/or follow up was missing
 - ✓ 7 pts undergone non-midline ventral hernia repair
 - ✓ 3 IPOM repair (2 IPOMS+1LIRA/ approach that did not match any group).
- Total 92 patients =n



Patient Demographic Characteristics grouped by operative approach

	Overall N = 92	1A n = 44	1B n = 7	2A n = 7	2B n = 3	3A n = 21	3B n = 7	4 n = 3	P
Age, median years (IQR)	64 (54-70)	60 (54-68)	53 (48-73)	59 (54-70)	66 (56-66)	65 (54-72)	67 (65-69)	66 (65-70)	0.476
Race, n=90 (%)									
Black	3 (3)	2 (5)	0	0	0	0	1 (14)	0	0.781
Hispanic	6 (7)	4 (9)	0	1 (17)	0	1 (5)	0	0	
White	81 (90)	37 (86)	7 (100)	5 (83)	3 (100)	20 (95)	6 (86)	3 (100)	
Sex, n (%)									
Male	78 (85)	42 (95)	6 (86)	3 (43)	3 (100)	17 (81)	5 (71)	2 (67)	0.009
Female	14 (15)	2 (5)	1 (14)	4 (57)	0	4 (19)	2 (29)	1 (33)	
Smoking Status, n (%)									
Current	3 (3)	1 (2)	1 (14)	0	0	1 (5)	0	0	0.090
Distant/Former	23 (25)	10 (23)	1 (14)	1 (14)	3 (100)	4 (19)	4 (57)	0	
Never	66 (72)	33 (75)	5 (71)	6 (86)	0	16 (76)	3 (43)	3 (100)	
BMI, median kg/m ² (IQR)	27.0 (24.4-30.1)	27.1 (25.2-29.3)	25.3 (24.2-28.4)	27.0 (23.6-28.6)	32.8 (32.8-33.0)	26.6 (23.8-30.5)	30.0 (26.4-31.0)	24.1 (23.9-26.8)	0.097
COPD, n (%)	0	0	0	0	0	0	0	0	NA
Hypertension, n (%)	32 (35)	15 (34)	1 (14)	0	2 (67)	8 (38)	4 (57)	2 (67)	0.117
Diabetes, n (%)	4 (4)	2 (5)	0	1 (14)	1 (33)	0	0	0	0.252
ASA class, n (%)									
1	5 (5)	4 (9)	0	0	0	1 (5)	0	0	0.133
2	67 (73)	35 (80)	7 (100)	6 (86)	1 (33)	12 (57)	4 (57)	2 (67)	
3	20 (22)	5 (11)	0 (0)	1 (14)	2 (67)	8 (38)	3 (43)	1 (33)	

Abbreviations: body mass index (BMI), chronic obstructive pulmonary disease (COPD), American Society of Anesthesiologists (ASA), interquartile range (IQR).

Patient Hernia and Operative Characteristics Sub-grouped by Operative Approach

	Overall N=92	1A n=44	1B n=7	2A n=7	2B n=3	3A n=21	3B n=7	4 n=3	P
VH Etiology, n (%)	64 (70)	42 (95)	7 (100)	3 (43)	3 (100)	8 (38)	0	1 (33)	<0.001
Primary	28 (30)	2 (5)	0	4 (57)	0	13 (62)	7 (100)	2 (67)	
Incisional									
Recurrent VH, n (%)	7 (8)	1 (2)	0	2 (29)	0	4 (19)	0	0	0.079
VH width, median cm (IQR)	1.5 (1.0-3.0)	1.0 (1.0-1.1)	1.5 (1.0-1.8)	2.0 (1.5-4.0)	2.0-2.5 (1.5-2.5)	4.0 (3.0-4.0)	7.0 (6.2-12.0)	3.0 (2.5-3.0)	<0.001
VH length, median cm (IQR)	1.5 (1.0-6.0)	1.0 (1.0-1.0)	1.5 (1.0-1.8)	4.0 (1.3-8.5)	3.0 (3.0-3.5)	7.0 (4.0-12.0)	15.0 (12.5-16.0)	2.0 (1.5-3.5)	<0.001
VH area, median cm² (IQR)	7.1 (3.1-49.5)	3.1 (2.9-3.4)	7.1 (3.1-9.8)	25.1 (5.9-136.7)	18.8 (15.7-23.6)	88.0 (25.1-172.8)	373.8 (231.7-589.0)	18.8 (12.6-33.0)	<0.001
MVHWG Grade, n (%)	64 (70)	33 (75)	4 (57)	6 (86)	0	15 (71)	3 (43)	3 (100)	
1	26 (28)	10 (23)	3 (43)	1 (14)	3 (100)	6 (29)	3 (43)	0	0.106
2	2 (2)	1 (2)	0	0	0	0	1 (14)	0	
3									
Diastasis recti, n (%)	15 (16)	0	0	0	1 (33)	11 (52)	3 (43)	0	<0.001
VHR Approach, n (%)	54 (59)	44 (100)	7 (100)	0	0	0	0	3 (100)	<0.001
Open	38 (41)	0	0	7 (100)	3 (100)	21 (100)	7 (100)	0	
Robotic									
Mesh, n (%)	74 (80)	31 (70)	2 (29)	7 (100)	3 (100)	21 (100)	7 (100)	3 (100)	<0.001
Mesh width, median cm (IQR), n=80	6 (4-15)	4 (4-4)	5 (4-6)	10 (6-10)	12 (10-12)	17 (15-19)	26 (22.5-30)	6 (6-7)	<0.001
Mesh length, median cm (IQR) n=80	6 (4-30)	4 (4-4)	5 (4.5-6)	15 (6-18)	20 (14.5-35)	30 (27-38.5)	35 (32.5-36)	6 (6-9)	<0.001
Mesh area, median cm² (IQR) (n=80)	36 (16-465)	16 (16-16)	26 (21-31)	150 (33-175)	240 (152-420)	540 (420-705)	1,000.0 (755-1,050)	36 (36-66)	<0.001
Inguinal hernia, n (%)	58 (63)	32 (73)	4 (57)	4 (57)	1 (33)	14 (67)	3 (43)	0	0.127
Bilateral	34 (37)	12 (27)	3 (43)	3 (43)	2 (67)	7 (33)	4 (57)	3 (100)	
Unilateral									
Inguinal Hernia Size, n (%)	31 (34)	17 (39)	0	4 (57)	0	7 (33)	3 (43)	0	
I (<1.5cm)	53 (58)	24 (55)	6 (86)	2 (29)	3 (100)	11 (52)	4 (57)	3 (100)	0.334
II (1.5-3cm)	8 (9)	3 (7)	1 (14)	1 (14)	0	3 (14)	0	0	
III (≥3cm)									
Complex Inguinal Hernia n (%)	29 (32)	12 (27)	2 (29)	1 (14)	3 (100)	8 (38)	3 (43)	0	0.229
OR time, n (%)	6 (7)	5 (11)	1 (14)	0	0	0	0	0	
<59 min	54 (59)	38 (86)	6 (86)	5 (71)	1 (33)	2 (10)	0	2 (67)	<0.001
60-119 min	26 (28)	1 (2)	0	2 (29)	2 (67)	17 (81)	3 (43)	1 (33)	
120-179 min	6 (7)	0	0	0	0	2 (10)	4 (57)	0	
≥180 min									
EBL, n (%)	85 (92)	43 (98)	7 (100)	7 (100)	2 (67)	19 (90)	4 (57)	3 (100)	0.018
≤20 ml	7 (8)	1 (2)	0	0	1 (33)	2 (10)	3 (43)	0	
>20-100 ml									
Drain, n (%)	6 (7)	0	0	0	0	3 (14)	2 (29)	1 (33)	0.012

Abbreviations: ventral hernia (VH), ventral hernia repair (VHR), interquartile range (IQR), operating room (OR), estimated blood loss (EBL), Modified Ventral Hernia Working Group (MVHWG)



30-day Outcomes grouped by Operative Approach

	Overall N = 92	1A n = 44	1B n = 7	2A n = 7	2B n = 3	3A n = 21	3B n = 7	4 n = 3	p
LOS (days), n (%)									
0	82 (89)	44 (100)	6 (86)	7 (100)	3 (100)	17 (81)	2 (29)	3 (100)	<0.001
1	9 (10)	0	1 (14)	0	0	3 (14)	5 (71)	0	
≥2	1 (1)	0	0	0	0	1 (5)	0	0	
ED visit, n (%)	3 (3)	0	0	0	0	2 (10)	1 (14)	0	0.209
Readmission, n (%)	3 (3)	0	0	0	0	2 (10)	1 (14)	0	0.209
Re-Operation, n (%)	2 (2)	0	0	0	0	1 (5)	1 (14)	0	0.282
SSI, n (%)	2 (2)	1 (2)	0	0	0	1 (5)	0	0	0.774
SSO, n (%)	4 (4)	1 (2)	1 (14)	0	0	2 (10)	0	0	0.532
SSOPI, n (%)	1 (1)	1 (2)	0	0	0	0	0	0	>0.999

Abbreviations: length of stay (LOS), emergency department (ED), surgical site infection (SSI), surgical site occurrence (SSO), SSI or SSO requiring procedural intervention (SSOPI).

Conclusions

- We propose an algorithm for decision-making based on our experience of incorporating robotic surgery, when available, for repair of concomitant VHR and IHR
- Integrating new minimally invasive surgical approaches (robotic surgery) to VHR and IHR offers many options for hernia repair that can be quite a challenge for the general surgeon and needs to be addressed properly.
- We achieved consistent favorable outcomes within a small sample of patients.
- Development of a comprehensive and flexible algorithm for the repair of simultaneous ventral and inguinal hernias is a complex endeavor that must be tailored to the individual patient's needs.
- Need for further research with more diverse patient populations and in varied clinical settings to enhance the generalizability and applicability of our findings.

Limitations

- ❖ Our cohort predominantly consisted of young, non-obese, male patients with low ASA scores, which may not represent the broader, more diverse patient population typically encountered in clinical practice.
- ❖ Reliance on advanced robotic techniques and the expertise of a high-volume center from a highly-equipped institution is not reflective of the resources available in all clinical settings.
- ❖ This algorithm was built by two surgeons with a marked focus on hernia repair and there's a clear risk that the approach may be overly influenced by their individual experiences and techniques, potentially overlooking a broader range of surgical perspectives and practices.
- ❖ Structured approach, it may not cover all clinical scenarios, underscoring the need for individualized patient care beyond the algorithm's scope.
- ❖ Follow-up period was limited to 30 days post-operation does not sufficiently capture long-term outcomes, complications and recurrence rates.
- ❖ The use of univariate statistical analysis in our very small samples cannot be considered to be statistically significant; furthermore, without a multivariate analysis we can only make limited observations and share our experience.



Thank you

NYULH Abdominal Core Health & Hernia Program





**NYU Langone
2nd Annual Hernia
Symposia**

The Alphabet Soup of Ventral Hernia Repair

Friday, May 3, 2024

Research and Academic Center
NYU Langone Hospital—Long Island

Q&A

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