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ORIGINAL ARTICLE

Evaluating EHS parastomal hernia classification for surgical planning: a retrospective analysis of 160 consecutive cases in a single center

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Abstract

Introduction Parastomal hernia (PH) is a prevalent complication following ostomy formation, presenting significant challenges in surgical management. This study aims to validate the European Hernia Society classification for PH through the application of the Hybrid Parastomal Endoscopic Repair (HyPER) method. The study focuses on establishing the practical utility of the European Hernia Society classification in a clinical setting, particularly in guiding surgical approaches and improving patient outcomes.

Materials and methods This retrospective observational study aimed to assess the utility of the European Hernia Society classification in planning surgical strategies for parastomal hernias. The validation of the classification of PH was based on the experience involving 160 patients in single center. Patients were classified according to the European Hernia Society criteria, and data were collected on patient demographics, clinical presentations, and surgical outcomes. Main goal was to assess the consistency and applicability of the European Hernia Society classification in predicting surgical challenges and outcomes.

Results The study found a predominance of complex Type III and IV hernias. The European Hernia Society classification was effective in categorizing PH, aiding in surgical planning and highlighting the increased complication rates associated with more complex hernia types. This study represents the largest single-center cohort treated for PH by a single team, providing a controlled evaluation of the HyPER technique's effectiveness.

Conclusions The validation of the European Hernia Society classification in this study is a significant advancement in the standardization of PH management. The findings demonstrate the classification's utility in enhancing surgical planning and patient-centered care. The study also opens avenues for further research into standardized approaches and techniques in PH treatment.

Keywords HyPER, parastomal hernia · Abdominal wall · Hernioplasty · Hernia

Introduction

Parastomal hernia (PH), a prevalent complication following ostomy formation, represents a substantial challenge in surgical practice. Characterized as a type of incisional hernia, PH is associated with considerable morbidity and impacts patient quality of life [1]. The European Hernia Society (EHS) has developed a classification system for PH, aiming to standardize diagnoses and guide therapeutic interventions [2]. However, despite its potential utility, the validity and clinical applicability of this classification system have not been extensively explored. The result of the above is a lack of consistency in both the presentation of treatment outcomes and the establishment of a common ground for the exchange of information and experiences.

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The EHS classification endeavours to categorize PH based on anatomical and clinical parameters, offering a framework for comparing treatment outcomes and facilitating clinical decision-making [2]. Prior studies have variably reported the incidence of PH, ranging from 3 to 47% for colostomies and 3–22% for ileostomies, underlining the need for a robust and universally applicable classification system [3–6]. This variability in incidence underscores the heterogeneity of patient populations and the complexities inherent in PH management.

Goal of this study is to assess the utility of the European Hernia Society classification in planning surgical strategies for parastomal hernias (PH) through a retrospective analysis of patients treated with the Hybrid Parastomal Endoscopic Repair (HyPER) technique. The validation of the classification of PH will be based on the experience associated with the use of the HyPER method in the treatment of PH [7]. By employing a comprehensive methodology that encompasses patient demographics, clinical presentations, and surgical outcomes, we seek to assess the reliability and practicality of the EHS classification in a clinical setting and surgical planning. Our objectives are to evaluate the consistency of the classification when applied by different clinicians, its predictive value regarding surgical outcomes, and its role in enhancing patient-centered care.

Critical component of our study is to evaluate how classification according to the EHS criteria impacts the complexity and extent of the surgical procedure. By correlating specific hernia types with the intricacies involved in the surgical approach, our research aims to provide valuable insights that can assist surgeons in future treatment planning and decision-making. Understanding the relationship between the EHS classification and the surgical process will enable surgeons to better anticipate the requirements of each case, from the selection of appropriate surgical tools to determining the need for more comprehensive and extensive repair techniques.

In our material, all parastomal hernias (PH) were treated using a single surgical technique (HyPER), and the perioperative period, the presence of potential complications, and the assessment of quality of life were observed. There is no certainty that this approach is the best one, and similar results might not be achievable using less complex surgical techniques than HyPER, especially in the case of small Type I hernias. However, the aim was to verify whether categorizing the complexity and intricacy of hernias according to the EHS classification has implications for predicting postoperative outcomes for the patient.

Materials and methods

This retrospective observational study aims to validate the EHS classification in context of surgical planning and predicting outcomes for PH, focusing on patients treated with the HyPER technique. The study was conducted using 160 patient records from a single tertiary care center specializing in colorectal surgery and hernia repair (Bielanski Hospital in Warsaw) (Figure 1). The study population consisted of patients who have undergone the HyPER procedure for symptomatic PH. Inclusion criteria included adult patients with documented PH who underwent surgery. Exclusion criteria encompassed patients with incomplete medical records, lack of follow-up. Patient records were reviewed to collect data including age, sex, body mass index (BMI), ASA score and details of the hernia (Table 1). All patients qualified for surgery were previously classified according to the appropriate type of parastomal hernia based on the 2014 EHS parastomal hernia classification during the qualification stage. In our protocol, we also assessed the necessity of soft tissue reconstruction, which we understood to mean the need for skin and fat flap surgery (such as panniculectomy, abdominoplasty, etc.). This was due to the fact that after the removal of the hernia sac and repair of the defect, there was an excess of flaccid and loose skin and subcutaneous tissue remaining at the stoma site. This often required resection and plastic surgery, if only to enable the application of a stoma bag.

All cases were classified into the appropriate type of EHS hernias based on CT imaging. The EHS classification of parastomal hernias is divided into 4 types. Assignment to the appropriate type depends on the size of the parastomal hernia orifice (with a cutoff point of 5 cm) and the presence (or absence) of a concomitant incisional hernia (cIH) following a previous operation. Subclasses of classification were defined as follows:

Type I: Primary Parastomal Hernia (PH) $\leq$ 5 cm without cIH.

Type II: Primary Parastomal Hernia (PH) $\leq$ 5 cm with cIH.

Type III: Primary Parastomal Hernia (PH) $>$ 5 cm without cIH.

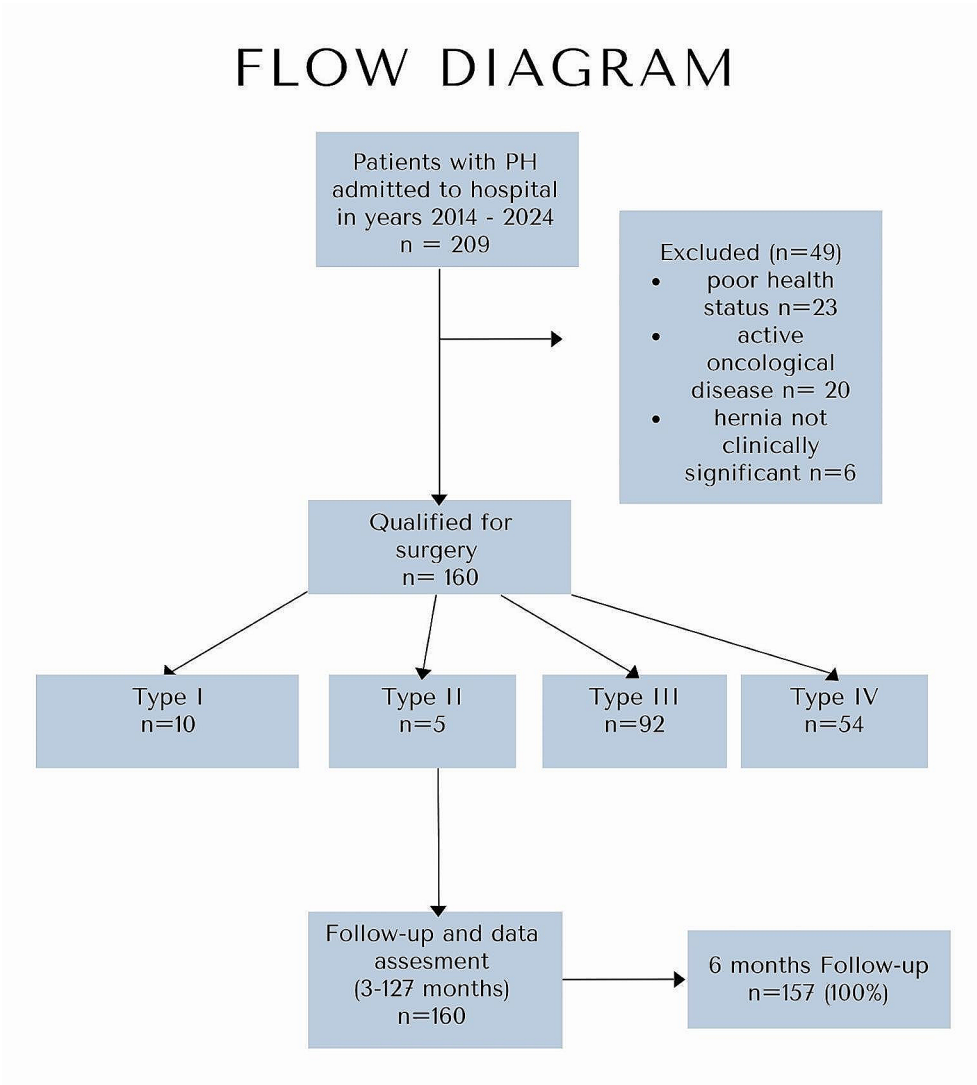
Type IV: Primary Parastomal Hernia (PH) $>$ 5 cm with cIH.

Additionally, it is noted whether the parastomal hernia was primary (P) or recurrent (R) [2].

Outcomes assessed were: recurrence rates, complications and extent of surgical procedure.

The HyPER procedure, as documented in the patient records, was reviewed. This includes assessing the technique's key stages, such as laparoscopic adhesiolysis, hernial sac dissection, mesh placement, and stoma formation or relocation [7, 8] (Video_1). At this point, it should be noted that by "stoma relocation" we mean creating a new

Fig. 1 Flow chart



stoma site within the skin. This is usually necessary due to performing a panniculectomy. In our material, there were no cases of "stoma relocation" that involved changing the location within the fascia (i.e., moving the stoma from the left to the right side, creating a new fascial channel, etc.).

This research study was conducted from data obtained for clinical purposes. Ethical approval was obtained by Ethics Committee by District Medical Chamber in Gdansk (KB 324). All methods were performed with the relevant guidelines and regulations. All protocols were maintained according to law regulations in Poland. Informed written consent was obtain from all subjects included in study.

Statistical analysis

All statistical analyses were performed using Statistica 13.1 (StatSoft Polska Sp. z o.o). Descriptive statistics were used to summarize the demographic and clinical characteristics of the patients. Categorical variables were presented as frequencies and percentages, while continuous variables were presented as means and standard deviations (SD) or medians and interquartile ranges (IQR), as appropriate.

Comparisons between different EHS classification types were made using Chi-square tests for categorical variables and ANOVA or Kruskal-Wallis tests for continuous variables, depending on the distribution of the data.

Results

The study classified PH according to the EHS criteria, based on a cohort of 160 patients (Table 2).

The mean hernia orifice diameter was 7.7 cm (range 2.7–15.0 cm, SD ± 2.4), and the mean hernia sac diameter was 16.8 cm (range 6–37 cm, SD ± 5.3). This data suggests a

Table 1 Demographic data and patients characteristics

	Characteristics (% of patients)
Age (years) median (range)	64.6 (28–88)
Sex	
male	95 (59%)
female	65 (41%)
BMI (kg/m^2) Median (range)	28.6 (19.53–39.06)
ASA grade:	
I	47 (29.4%)
II	69 (43.1%)
III	37 (23.1%)
IV	7 (4.4%)
Indications for Stoma Creation	Colorectal cancer – 131 Inflammatory Bowel Disease – 10 Other factors (fistulas, constipation, decubital ulcer, stool incontinence, prostate cancer) – 19
Indications for Parastomal Hernia Repair	Difficulty with ostomy appliances – 38 Parastomal Hernia Size – 87 Poor cosmetic effect – 49 Pain/discomfort – 141 Episodes of intestinal obstruction – 32
Parastomal Hernia Orifice Dimeter	7.7 (range: 2.7–15; SD +/- 2.4)
Parastomal Hernia Sac Diameter	16.8 cm (range 6–37 cm; SD ± 5.3).

Table 2 Hernia types and outcomes

TYPE OF HERNIA	TYPE I ($n=10$)	TYPE II ($n=5$)	TYPE III ($n=92$)	TYPE IV ($n=54$)
Soft Tissue Reconstruction	6 of 10 (60%)	4 of 5 (80%)	53 of 92 (57.6%)	40 of 54 (74%)
Stoma Relocation	6 of 10 (60%)	4 of 5 (80%)	69 o 92 (75%)	45 of 54 (83%)
Stoma reduction	10 of 10 (100%)	5 of 5 (100%)	88 of 92 (95.6%)	51 of 54 (94%)
Average time of surgery	180.5 (SD +/- 61.71; range: 90–295 min)	163 (SD +/- 26.12; range: 135–190 min)	173.01 (SD +/- 44.42; range: 90–345 min)	188.96 (SD +/- 41.07; range: 105–300 min)
Postoperative complications (requiring rehospitalization)	-	-	SSI – 7 Intraoperative bowel injury – 2 Hematomas – 3 Stoma necrosis – 1 Intestinal obstruction – 1	SSI – 7 Hematomas – 2
Recurrences (Overall)	-	-	4 (4.3%)	6 (11.1%)
Recurrences (after 2-years follow-up) – total patients – 141			3 (range: 2–4 years)	5 (range: 2–6 years)
Two-stage surgery	-	-	-	3 of 54 (5.6%)
Mean Patient Satisfaction before surgery (VAS scale)	3.25	2.5	3.32	3.14
Mean Patient Satisfaction after surgery (VAS scale)	8.7	9	9.26	9.2

predominance of more complex hernia types (III and IV) in the patient population.

The indications for stoma creation varied, with colorectal cancer being the most common reason (131 patients), followed by inflammatory bowel disease (10 patients), and other less frequent causes such as recto-vaginal fistula, constipation, stool incontinence, decubital ulcer, and prostate cancer.

The primary indications for surgery were difficulty with ostomy appliances (38 patients), PH size (87 patients), poor cosmetic effect (49 patients), pain/discomfort (141 patients), and episodes of intestinal obstruction or passage difficulties (32 patients).

Patient satisfaction was measured using a simple Visual Analogue Scale (VAS) before the surgery and after three months follow-up. Patients were asked to rate their overall satisfaction with the outcomes of the surgery before and after the procedure on a scale from 1 to 10. This scale was used to gather a general sense of patient satisfaction rather than a detailed assessment of quality of life. We did not use a formal, previously validated instrument for this purpose, nor did we ask specific, detailed questions related to various

aspects of quality of life. The questions were general, aimed solely at understanding the patients' overall satisfaction with the surgical results. This method provided a straightforward measure of patient contentment, without delving into the broader and more complex aspects of quality of life that would require a validated questionnaire. (Table 2).

The mean follow-up time was 57 months. Longest: 127 months, shortest – 3 months. All patients attended the 6-month follow-up. 141 patients underwent a 2-year follow-up, among whom 8 experienced a recurrence (3 in Type III and 5 in Type IV).

There were total 10 (6.25%) recurrences observed after surgery. These results indicate that while the HyPER procedure for PH repair was generally effective and led to high patient satisfaction, a small percentage of patients experienced hernia recurrence within the follow-up period. All recurrences were related to hernias classified as Type III and IV in the EHS classification, proving that the above type is associated with a much greater clinical challenge and poorer outcomes. No recurrences and complications were seen in patients operated with type I and II PH.

Type I

In our cohort, a total of 10 patients were identified with Type I hernias (6.25% of cases). Notably, 6 out of 10 of these cases required extensive soft tissue reconstruction due to substantial deformities. Additionally, 6 out of 10 of the patients with Type I hernias also necessitated the relocation of their stomas. The repositioning typically remained on the same side, with adjustments made either inferiorly or superiorly to the original site. All patients in this group underwent a shortening of the stoma, which refers to reducing the length of the bowel that is exteriorized extracorporeally. This involves adjusting the segment of the bowel that protrudes through the abdominal wall to create the stoma. The goal is to optimize the stoma's length for better function and management while ensuring it remains within the appropriate anatomical and functional parameters. The average duration of these surgical procedures was 180.5 min, with a standard deviation of ± 61.71 min, indicating a range of 90 to 295 min. The mesh utilized for the repair in all Type I cases was a Dynamesh IPST® (FEG-Textiltechnik, Aachen, Germany) of size 15×15 cm. There were no recurrences or complications reported in this subset of patients.

Type II

A total of 5 patients were treated for Type II hernias (2.5%). Among these cases, 8 out of 10 required soft tissue reconstruction due to substantial deformities. Furthermore, 8 out of 10 of the patients also underwent stoma relocation and all patients underwent shortening of stoma. The average duration of the surgical procedures for Type II hernias was 163 min, with a standard deviation of ± 26.12 min, representing a range of 135 to 190 min. Two patients in this category received a Dynamesh IPST® (FEG-Textiltechnik, Aachen, Germany) measuring 15×15 cm, while the remaining three patients were provided with a larger 25×25 cm Dynamesh IPST® (FEG-Textiltechnik, Aachen, Germany). There were no reported recurrences or complications in any of the Type II hernia cases.

Type III

Type III hernias were the most frequently observed, present in 92 patients, accounting for approximately 57.5% of cases. Among these cases, 53 patients (57.6%) required soft tissue reconstruction due to substantial deformities. Stoma relocation was performed in 69 out of 92 cases (75%), indicating the need for changes in stoma placement. Additionally, stoma shortening was carried out in 88 out of 92 cases (95,6%). The average duration of surgery for Type III hernias was approximately 173.01 min, with a standard deviation of ± 44.42 min, ranging from 90 to 345 min. Mesh sizes were used, including Dynamesh IPST® (FEG-Textiltechnik, Aachen, Germany) in dimensions of 15×15 cm (55/92), 16×16 cm (10/92), 17×17 cm (7/92), 20×20 cm (2/92), and 25×25 cm (17/92). Type III hernias were also associated with a higher rate of complications compared to other types, including: SSI (7/92), Intraoperative bowel injury (2/92), hematomas (3/92), stoma necrosis (1/92), intestinal obstruction (1/92). There were also 4 recurrences present.

Type IV

These complex hernias were identified in 54 patients, making up 33.75% of the total cases. 40 out of 54 cases required soft tissue reconstruction due to substantial deformities (74%). Stoma relocation was carried out in 45 out of 54 cases (83%), and stoma reduction was performed in 51 out of 54 cases (94%). The average duration of surgery for Type IV hernias was approximately 188.96 min, with a standard deviation of ± 41.07 min, ranging from 105 to 300 min. Mesh sizes were used, including Dynamesh IPST® (FEG-Textiltechnik, Aachen, Germany) in dimensions of 15×15 cm (19/54), 17×17 cm (1/54), 25×25 (31/54) and 30×30 cm (3/54) Among the cases of Type IV hernias, there were 9 reported complications, including 7 cases of infections and 2 cases of hematomas and 6 recurrences.

For these hernias, where a fascial bridge (at least 3 cm) was present between the parastomal and incisional hernia, a two-stage surgical approach was employed. Initially, the

postoperative hernia was repaired, followed by a second surgery 6 months later to address the PH.

In cases where no fascial bridge existed and there was complete destruction of the abdominal wall, a one-stage procedure was performed.

Discussion

PH present a substantial surgical challenge, despite the availability of various techniques like the Pauli, Keyhole, and Sugarbaker methods [9–14]. Some techniques consists of relocation of the stoma, with prophylactic mesh in a sublay position at the new site and sublay mesh repairing the incisional hernia at the primary site [15]. The absence of a universally accepted "gold standard" for treatment underlines the complexity of these cases. Many surgeons, including those specializing in anterior abdominal wall surgery (AWR), find themselves at a crossroads when it comes to managing PH. Patients often face discouragement from pursuing surgery, as they are frequently referred elsewhere due to the perceived complexity and controversy surrounding these procedures.

Scientific societies too seem hesitant to focus extensively on this topic, likely due to its contentious and challenging nature. The EHS classification for PH, established in 2014, was a step towards standardization [2]. However, even a decade later, this classification has not been widely validated or adopted in clinical practice. This lack of validation and widespread adoption creates barriers in discussions and debates about treatment methods and their outcomes.

In addition to the aspects, it is noteworthy to mention the development of EHS guidelines in 2018 specifically addressing PH [1]. These guidelines, while a substantial step towards standardizing the approach to PH management, revealed a critical gap in the existing body of knowledge. The key takeaway from these recommendations is the stark realization that there is a substantial lack of clinical data necessary to formulate comprehensive and robust guidelines.

The ongoing uncertainty and lack of consensus in the surgical community highlight the need for more focused research and dialogue in this area. The complexity of PH, coupled with the diversity of patient presentations, necessitates a more standardized approach to facilitate effective treatment strategies and improve patient outcomes. The validation of the EHS classification, as well as the exploration of new surgical techniques and their outcomes, are crucial steps in addressing these challenges and advancing the field of hernia surgery.

Our study demonstrates the practical utility of the EHS classification in a clinical setting. By categorizing PH according to defect size and the presence of cIH, as proposed by the EHS, we were able to observe distinct patterns in treatment outcomes after HyPER repair. This supports the EHS's initiative to create a standardized classification system that can potentially guide treatment decisions and predict patient outcomes more effectively.

The application of the HyPER procedure within the framework of the EHS classification has shown promising results, particularly in managing complex PH cases. The stratification of hernias into types I-IV as per the EHS criteria allowed for a more nuanced understanding of each case's complexity and the corresponding surgical approach needed. This stratification could be invaluable for surgical planning and patient counselling.

The correlation of our findings with existing classifications and studies on PH underscores the need for a standardized approach. Previous classifications [1, 16–19] have varied in their criteria and practical applicability. Our study aligns with the EHS's effort to consolidate these various systems into a more universally applicable and clinically useful model.

The insights gained from our study pave the way for future research, particularly in conducting randomized controlled trials using the EHS classification. Such trials could provide more definitive evidence on the effectiveness of different surgical techniques, including the HyPER procedure, in managing PH across the various classification types.

The role of EHS classification in surgical planning

The classification system plays a pivotal role in the surgical planning of PH. This classification's simplicity and accessibility are key factors in its clinical utility. After conducting a computed tomography (CT) scan and classifying the hernia into the appropriate EHS category, surgeons can more accurately plan the surgical procedure and anticipate the potential postoperative course.

The EHS classification allows for a standardized approach to categorize hernias based on anatomical and clinical characteristics. This standardization aids in developing a more tailored surgical strategy. For example, the identification of hernias as Type III or IV, which are more complex and prevalent in our study cohort, alerts the surgeon to the likelihood of a higher complication rate. This information is crucial for preoperative planning, especially in anticipating the need for larger mesh sizes and more extensive tissue reconstruction. Moreover, the classification system assists in decision-making regarding patient referrals. More complex cases, such as those falling under Type III and IV, might be better managed in specialized, reference centers with greater experience and resources for handling such intricate surgeries. This approach not only optimizes

patient care but also contributes to a more efficient allocation of medical resources.

Our study's findings also emphasize the higher incidence of complications in Types III and IV hernias. This observation reinforces the need for surgeons to be particularly vigilant in these cases, considering the increased complexity and potential for postoperative issues. The EHS classification thus becomes an indispensable tool in surgical planning, helping to set realistic expectations and prepare for potential challenges.

In Table 2, it is noted that 3 patients required a two-stage repair. This is due to the large and complex nature of the defects associated with Type IV parastomal hernias. These cases necessitated an initial procedure to repair the postoperative midline hernia (mesh in retrorectus space), followed by a second surgery six months later to address the parastomal hernia. Highlighting this point emphasizes the challenging nature of managing extensive hernias and the tailored approach required to ensure optimal patient outcomes.

It should be mentioned that the high percentage of stoma relocations in the material may not result directly from the categorization of parastomal hernia according to the EHS classification but rather from the surgical technique associated with the HyPER method and the implantation of the dedicated mesh itself (Video_1).

Limitations

While our study provides valuable data, there are inherent limitations in its retrospective nature. Prospective studies with larger sample sizes are needed for a more comprehensive validation of the EHS classification. Additionally, the implementation of this classification system across different healthcare settings might pose challenges, requiring education and adaptation in clinical practice.

To the best of our knowledge, this study represents the largest single-center cohort of patients undergoing surgery for PH, treated by a single surgical team using a uniform method. This consistency in the treatment approach provides a unique opportunity to evaluate the outcomes of the HyPER procedure in a relatively homogenous patient population. However, this approach also raises questions regarding the generalizability of the findings. While the uniformity of the treatment method and the single-center nature of the study allow for a controlled evaluation of the surgical technique and its outcomes. HyPER method is relatively complex and intricate and was used for all types of hernias. Perhaps in the case of less complicated defects (Type I), equally good results could be achieved using less complicated techniques. However, we do not demonstrate this in our material.

Critical perspective on the EHS classification

Arbitrary cut-off at 5 cm

The EHS classification's use of a 5 cm cut-off line between small and large PH should be reconsidered. This fixed boundary may not adequately account for variations in patient body size and composition. For example, a 5 cm hernia could be a relatively small area on the body surface of larger individuals but a substantially larger proportion for smaller patients. This one-size-fits-all approach may not accurately reflect the clinical significance of the hernia size in relation to the patient's overall body structure. We believe it is worth considering the potential benefits of a more individualized measurement approach, such as calculating the defect area relative to the patient's overall anterior abdominal wall surface area (for example, using measurements during CT scan).

Relevance of defect size in type IV hernias

In Type IV hernias, the critical factor is not solely the size of the defect but also the presence or absence of a fascial bridge between the PH and any postoperative hernia. This distinction is crucial as it influences the surgical approach. In cases where no fascial bridge is present, resulting in a single large hernia, a one-stage repair might be necessary for optimal results. Conversely, if a fascial bridge exists (at least 3 cm wide), allowing for clear separation between hernias, a two-stage repair may be feasible. This nuance is not fully captured in the EHS classification, which could lead to oversimplification of complex clinical scenarios. Based on biomechanical data regarding the implant and the anterior abdominal wall, we believe that 3 cm is the minimum value for performing a valuable retromuscular (sublay) repair. In such situations, we conduct a two-stage procedure: first, we perform a classic midline hernia repair, and then 3–6 months later, we perform the parastomal hernia repair.

Role of preoperative CT scan

it is important to note that both the EHS classification and its predecessor, the Bielanski Hospital Classification (BHC), are fundamentally clinical classifications. These classifications directly relate to the clinical situation but are determined based on CT scan findings. Drawing from our experience, we observe that while CT scans are instrumental in assessing PH, they often underestimate the true extent of the hernia. Our findings indicate that the underestimation could be by at least 20%. This discrepancy between CT imaging and actual clinical findings presents a substantial challenge in surgical planning. It implies that while CT scans provide

invaluable initial insights for classifying hernias according to the EHS system, surgeons must be prepared for potential variations encountered during the actual surgical procedure. This underestimation can impact the selection of the appropriate surgical technique, the choice and size of mesh for hernia repair, and the overall approach to the surgical intervention. Given this observation, there is a pressing need for further research to understand the reasons behind this discrepancy and to explore methods to bridge this gap. Future studies should focus on comparing the preoperative CT scan assessments with intraoperative findings, to quantify the extent of underestimation and identify specific patterns or types of hernias where this discrepancy is more pronounced.

Generalisability

Majority of studies on PH lack a standardized classification system. This absence of classification in much of the existing literature means that there is a substantial gap in our understanding of exactly which patient groups are being operated on. The lack of this vital information hinders the ability to draw comprehensive and comparative conclusions across various studies, and it obscures the clarity needed in understanding the effectiveness of different surgical interventions. The importance of a standardized classification system in surgical studies cannot be overstated. Without it, comparing outcomes, assessing the efficacy of different surgical techniques, and even determining the appropriate patient cohort for each type of surgery becomes increasingly challenging. This lack of classification in studies of PH points to a broader issue within the field – the need for a more structured and systematic approach to research and data reporting.

The authors are convinced that their work represents the first and an extremely important step towards the dissemination and validation of the EHS classification. Without this initiative, a discussion on the outcomes and quality of various techniques is not feasible. Without a good and widely used classification (introducing a common denominator into the discussion), it is impossible to plan any meaningful Randomized Controlled Trial to compare any data.

Conclusions

Our study's findings closely correspond with the objectives and classification criteria established by the EHS for PH. The EHS classification has proven to be a vital tool in guiding surgical approaches for PH. Its straightforward categorization assists surgeons in anticipating the complexity of cases, especially for Type III and IV hernias, and in tailoring surgical strategies accordingly. The classification's predictability aids in forecasting potential postoperative courses and preparing for challenges such as the need for more sophisticated equipment and hospital environment in more complex hernias. In our cohort, the distribution of PH types across the EHS categories provided valuable insights into the classification's relevance in differentiating treatment strategies and predicting surgical outcomes. By offering a comparative analysis of outcomes based on this standardized classification, our study supports the EHS's goal of enhancing consistency and comparability across various clinical studies and trials in PH management.

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Data availability All data will be presented on reasonable request.

Declarations

Ethics approval and consent to participate This research study was conducted from data obtained for clinical purposes. Ethical approval was obtained by Ethics Committee by District Medical Chamber in Gdansk (KB 324). All methods were performed with the relevant guidelines and regulations. All protocols were maintained according to law regulations in Poland. Informed written consent was obtain from all subjects included in study.

Conflict of interest Authors declare that they have no conflict of interest.

Reprint request Reprints will be available. Requests should be addressed to Mateusz Zamkowski (corresponding author).

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