ORIGINAL ARTICLE

Concurrent Pathologies in Hysterectomy Specimens for Uterovaginal Prolapse: A Retrospective Study in a Malaysian Cohort

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ABSTRACT

Introduction: Uterovaginal prolapse (UVP) is often treated surgically, with resected uteri routinely sent for histopathology. Most findings are non-specific, but incidental pathological conditions may be present. As uterine-preserving surgeries increase, the necessity of routine histopathological examination in UVP is questioned. Although the risks of premalignant and malignant conditions are low, understanding the prevalence and types of concurrent findings is important, especially in multiracial populations like Malaysia, where data are limited. This study investigates concurrent pathology in UVP hysterectomy specimens and their associations with age, ethnicity, and UVP stage. **Materials and methods**: A retrospective review of 179 UVP-related hysterectomy cases from 2019 to 2021 was conducted at a Malaysian tertiary hospital. Data on patient demographics, UVP stage, and pathological findings were analysed using descriptive and inferential statistics. **Results:** Patients were aged 42–81 years, with 68.1% aged ≥60. Stage 2 UVP was the most common (41.9%). Pathological findings were observed in 109 cases (60.9%), with 31 (28.4%) exhibiting multiple pathologies. Leiomyomas were the most frequent (37.4%). Premalignant lesions were rare, with atypical endometrial hyperplasia detected in 0.6% of cases, and no malignancies were identified. Malays accounted for the highest proportion of concurrent pathologies (45.8%), followed by Indians and Chinese. A significant association was found between concurrent pathologies and ethnicity (p=0.029) as well as between UVP stage and age (p=0.026). **Conclusion:** Despite the low risk of malignancy, the high prevalence of benign concurrent conditions justifies the continuation of histopathological examination of UVP hysterectomy specimens. This remains important as uterine-sparing surgeries increase, and demographic factors may influence pathological outcomes.
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INTRODUCTION

Pelvic organ prolapse (POP) is a benign gynaecological condition that affects women worldwide. It occurs when one or more organs in the pelvic cavity herniate into the vagina due to the weakening of supporting structures, such as muscles and ligaments in the pelvic floor. Uterovaginal prolapse (UVP) refers explicitly to the descent of the uterus into the vaginal canal.

Although UVP is more frequently observed in older age groups, research has shown that it can occur in women of all ages. For example, Kulkarni et al. (2020) reported that 22% of patients affected were younger than 30 years old (1).

The global prevalence of UVP varies widely, ranging from as low as 6% to as high as 65% depending on population characteristics and diagnostic methods (2-5,8-10). While UVP is not considered life-threatening, it has been shown to significantly impact women's psychosocial well-being, emotional health, and overall quality of life (11,12). However, accurately estimating its financial burden remains challenging due to the lack of standardised measures (13).

The aetiology of POP is multifactorial. Studies consistently indicate that parity, vaginal deliveries, waist-hip ratio, advancing age, and excessive stretching and tearing are

independent risk factors for POP (2,3,4). Additionally, sociocultural elements, such as socioeconomic status, labour-intensive occupations, and insufficiently trained personnel at births, have also been implicated (5,6). Interestingly, caesarean sections serve as a significant protective factor (7), further underscoring the complex interplay of risk determinants.

The diagnosis of UVP primarily depends on recognising the condition through the patient's symptoms, clinical history, and physical examination. Pelvic examination is central to the diagnosis of UVP. A pelvic examination allows the clinician direct visualisation of the prolapsed organ and is critical for staging purposes. The practice in Malaysia adopts the Pelvic Organ Prolapse Quantification (POP-Q) System, where the distal-most portion of the prolapsed uterus was measured above or below the hymenal plane in centimetres. Patients are grouped into stage 0 (no prolapse), stage 1 (>1cm above the hymen), stage 2 (≤1cm above or below the hymen), stage 3 (>1cm but ≤2cm of the total vaginal length) or stage 4 (complete vaginal eversion) (14). Radiological imaging techniques such as ultrasound and pelvic MRI may assist in confirming the diagnosis; however, high-degree prolapse is often apparent during a pelvic examination.

Management strategies depend on symptom severity and patient preferences. These range from conservative approaches like pessary use and pelvic floor therapy to surgical interventions, especially in cases of advanced prolapse or failed conservative treatment (15). Transvaginal hysterectomy, with or without pelvic floor repair, is the most common surgical approach for treating UVP. In recent decades, there has been growing interest in uterine-conserving surgery, stemming from a deeper understanding of the functions of female reproductive organs. This shift has raised concerns regarding the benefits of uterine conservation versus the risks of retaining a uterus that may harbour other pathological conditions necessitating further monitoring or intervention (16,17).

To address this concern, resected uteri from UVP procedures are routinely sent for comprehensive histopathological examination. Although the findings in UVP cases are often non-specific, literature dating back to 1970 has identified the presence of concurrent pathological findings in hysterectomy specimens associated with UVP (18). Such conditions, which can interfere with surgical planning and may prompt the clinician to initiate further intervention or monitoring, include benign pathologies such as leiomyoma and adenomyosis, as well as premalignant conditions like cervical epithelial dysplasia and endometrial hyperplasia, alongside potential malignancies.

Previous literature has documented a frequency of concurrent pathological conditions ranging from 21% to 66% in hysterectomy specimens performed for UVP. Most of these conditions are benign, with only a small percentage classified as premalignant or malignant. This has prompted debate on whether histopathological examination of hysterectomy specimens for UVP is necessary, given the low risk of malignancy (19,20).

Although UVP is a benign condition primarily managed based on clinical findings, hysterectomy specimens often reveal concurrent pathological findings, some of which may require further clinical attention. With the increasing trend toward uterine-conserving surgeries, understanding the nature and frequency of these concurrent pathologies becomes important to inform surgical decision-making and postoperative management. Moreover, while several studies have explored this issue in various populations, data remain scarce for multiethnic cohorts like Malaysia's. The influence of demographic factors, such as age and ethnicity, on these findings also warrants further investigation.

Therefore, this study aims to investigate the frequency and types of concurrent pathological findings in UVP-related hysterectomy specimens and to evaluate their associations with clinicodemographic factors, including age, ethnicity, and UVP stage.

MATERIALS AND METHODS

Sample

This retrospective study analysed 179 cases of UVP between January 2019 and December 2021 at the Department of Pathology, Hospital Kuala Lumpur. A purposive sampling method was used to select cases that met the inclusion criteria: 1) a clear clinical diagnosis of 'uterovaginal prolapse' was documented on the pathology request form regardless of the stage, 2) hysterectomy with or without salphingo-oophorectomy was performed, and 3) the histopathology examination (HPE) reports were strictly validated by a pathologist. Cases with any known gynaecological disease, missing pathology request forms, as well as demographic and clinical information were excluded. The archived HPE reports, demographic data including age and ethnicity, along with clinical details such as the stage of UVP and pathological diagnoses, were manually extracted and recorded.

Statistical analysis

All data were analysed using IBM SPSS Statistics for Windows, Version 28.0.1.1 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarise demographic and clinical characteristics. Associations between categorical variables (e.g., age group, ethnicity, UVP stage, and presence of concurrent pathology) were assessed using the Chi-square (χ^2) and Fisher's exact test. A p-value of less than 0.05 was considered statistically significant at a 95% confidence interval.

Ethical approval

The study obtained approval from the Medical Research Ethics Committee, Malaysia (NMRR ID-23-00694-6SF).

RESULTS

Clinico-demographical distribution

Among the 179 cases of uterovaginal prolapse, patient ages ranged from 42 to 81 years, with a mean age of 63.1 ± 7.9 years. The majority (68.1%) were aged 60 years or older, followed by those aged 50-59 (27.4%), while the smallest group was below 50 (4.5%). In terms of ethnicity, Malays represented the largest group (45.8%), followed by Indians (28.5%) and Chinese (23.5%). Regarding UVP staging, stage 2 was the most frequently observed (41.9%), followed by stage 4 (32.4%) and stage 3 (21.2%), with stage 1 accounting for only 4.5% of cases. Concurrent pathological findings were identified in 109 (60.9%) cases within the uterus, cervix and/or adnexa. Of these, 31 (28.4%) had multiple concurrent pathological findings, resulting in 142. A total of 108 (60.3%) cases had benign concurrent pathological findings, one (0.6%) had premalignant endometrial pathology, and none had malignant pathology. The premalignant endometrial pathology exhibited atypical hyperplasia arising in an endometrial polyp. Table I lists the distribution of hysterectomy specimens performed for uterovaginal prolapse according to age, ethnicity, stage of UVP and concurrent pathologies. Fig.1-3 represents three UVP cases with concurrent pathology.

Table I: Distribution of uterovaginal prolapse cases according to age, ethnicity, stage of uterovaginal prolapse (n=179) and concurrent pathologies (n=142).

Variable	Category	Number of Cases	Percentage (%)
Age (years)	≤ 50	8	4.5
	50 – 59	49	27.4
	60 – 69	84	46.9
	≥ 70	38	21.2
Ethnicity	Malay	82	45.8
	Chinese	42	23.5
	Indian	51	28.5
	Others	4	2.2
Stage of Uterovaginal Prolapse	1	8	4.5
	2	75	41.9
	3	38	21.2
	4	58	32.4
*Concurrent Pathological Findings	Benign		
	Leiomyoma	67	37.4
	Adenomyosis	41	22.9
	Endometrial polyp	21	11.7
	Cervical polyp	5	2.8
	Uterine lymphangioma	1	0.7
	Benign ovarian cyst	1	0.6
	Ovarian serous cystadenoma	1	0.6
	Ovarian fibroma	2	1.1
	Endometriosis of fallopian tube	1	0.6
	Endometrial hyperplasia without atypia	1	0.6
	Premalignant		
	Endometrial hyperplasia with atypia	1	0.6
	Malignant	0	0.0

*The total number of concurrent pathological findings is 142 (n=142) from 109 patients, where some patients have multiple findings.

CONTINUE

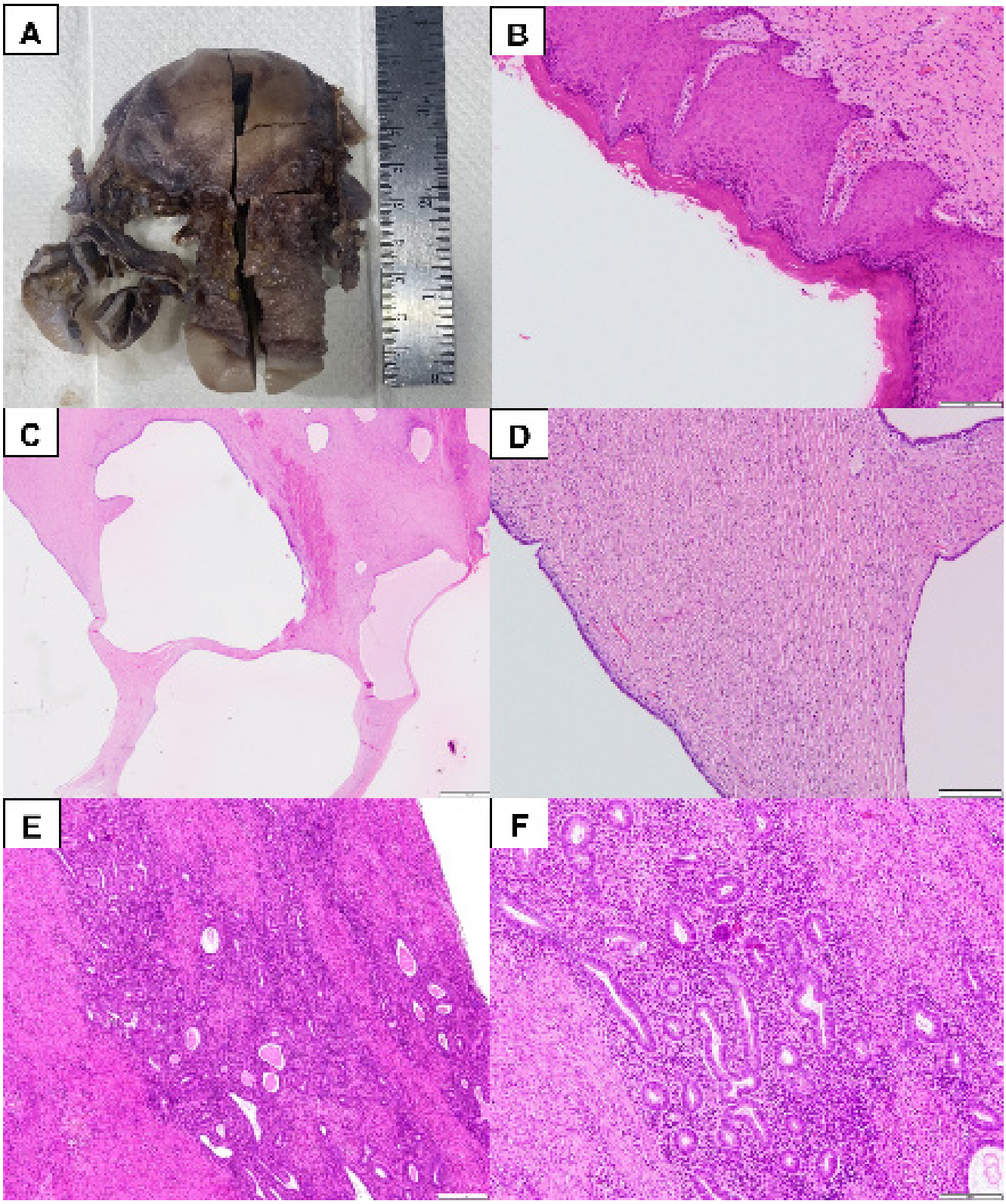

Fig 1: A photograph of a specimen of uterus and ovaries from a 65-year-old woman, para 6+1 with uterovaginal prolapse stage 4. She had two concurrent pathologies, endometrial hyperplasia and a right ovarian cyst (seen in photograph A). Histological sections show keratinising squamous epithelium of the ectocervix (B: 100x magnification), right serous cystadenoma lined by a single-layered flat to cuboidal epithelium (C: 20x magnification, D: 100x magnification) and endometrial hyperplasia exhibiting focal branching and fused glands without cellular atypia (E: 40x magnification, F: 100x magnification) (Haematoxylin & Eosin stain).

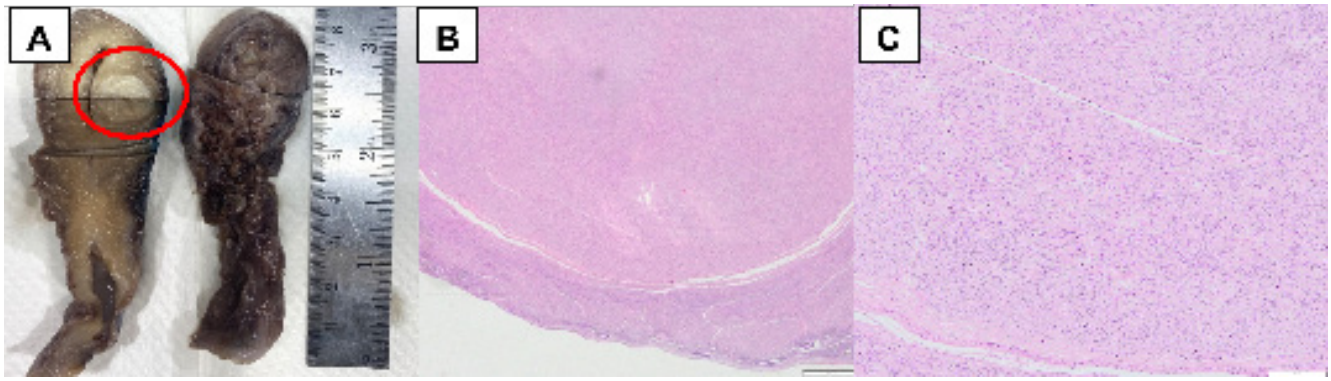

Fig 2: A photograph of a uterus specimen from a 66-year-old woman with a uterovaginal prolapse stage 3. She had a concurrent leiomyoma depicted in a red circle (A). Histological section of the leiomyoma shows a circumscribed mass composed of mildly pleomorphic spindle cells with scant mitosis and without necrosis (B: 20x magnification; C: 100x magnification; Haematoxylin & Eosin stain).

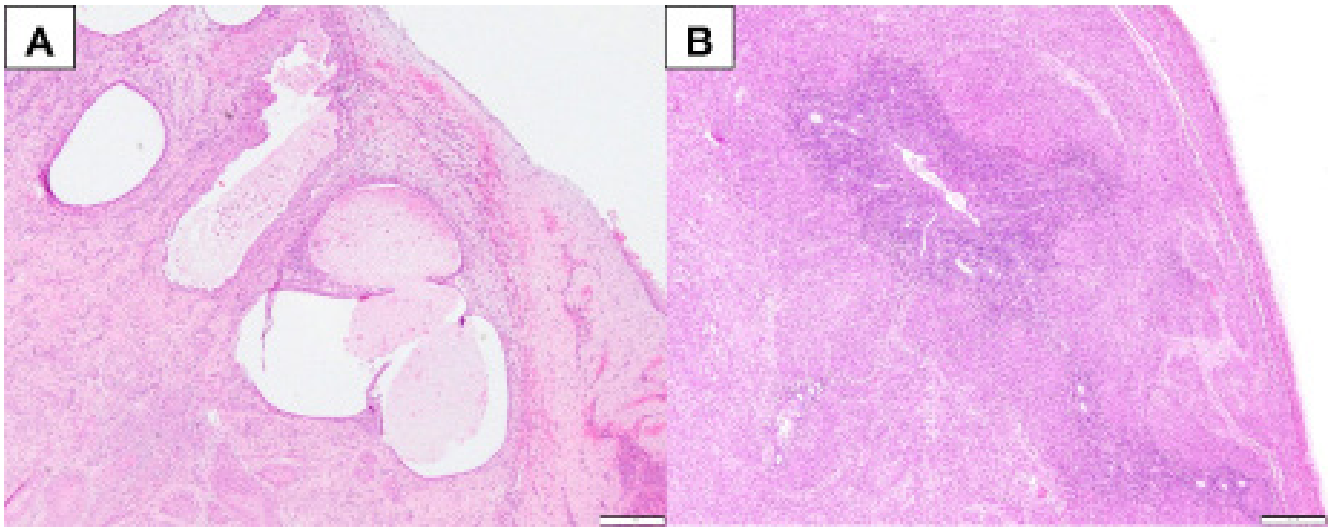

Fig 3: Uterovaginal prolapse stage 2 in a 67-year-old woman. The ectocervix is denuded and inflamed with multiple subepithelial Nabothian cysts (A; 40x magnification). She had a concurrent adenomyosis (B; 40x magnification) (Haematoxylin & Eosin stain).

The association between the concurrent pathological findings and clinico-demographical characteristics

Statistical analysis revealed a significant association between concurrent pathology and ethnicity (p = 0.029), with Indians (37, 72.5%) and Malays (52, 63.4%) showing higher rates of concurrent pathology. However, the presence of concurrent pathology did not have any significant association with age or the stage of uterine prolapse. Nonetheless, concurrent pathology is mostly observed in individuals aged 60 years or older (77, 63.1%) and at stage 2 (40, 53.3%) and 4 (40, 69%), which aligns with the cohort distribution. Table II summarises these associations.

Table II: The association of the concurrent pathological findings with age, ethnicity and stage of uterine prolapse

Variable	Concurrent pathological findings			
	Present	Absent	Total (%)	p-value
Age (years)				
<60	32	25	57 (32)	0.233
≥60	77	45	122 (68)	
Ethnicity				
Malay	52	30	82 (45.8)	0.029*
Chinese	18	24	42 (23.5)	
Indian	37	14	51 (28.5)	
Others	2	2	4 (2.2)	
Stage of uterine prolapse				
1	6	2	8 (4.5)	0.249
2	40	35	75 (41.9)	
3	23	15	38 (21.2)	
4	40	18	58 (32.4)	

* Statistically significant (p < 0.05)

The association between the stage of uterovaginal prolapse and age, ethnicity and concurrent pathological findings

A significant association was found between the stage of uterine prolapse and age (p = 0.026), with stage 2 (40.2%) and 4 (38.5%) being most commonly observed in patients over 60 years of age. There was no significant association between the stage of uterine prolapse and ethnicity or concurrent pathological findings. Among 179 hysterectomy specimens, the majority had one concurrent pathology (43.6%), followed by no pathology (39.1%), two (15.1%), and three (2.2%) concurrent pathologies. Multiple pathologies were seen across all stages, except for the absence of three concurrent pathologies in stage 1. The distribution of different categories of pathology did not differ significantly across prolapse stages (p = 0.720). Table III summarises these findings.

Table III: The association of stage of uterine prolapse with age, ethnicity and concurrent pathological findings.

Variable	Stage of uterine prolapse					
	1	2	3	4	Total (%)	p-value[a]
Age (years)						
<60	2	26	18	11	57 (32)	0.026*
≥60	6	49	20	47	122 (68)	
Ethnicity						
Malay	4	34	15	29	82 (45.8)	0.726
Chinese	1	22	7	12	42 (23.5)	
Indian	3	18	15	15	51 (28.5)	
Others	0	1	1	2	4 (2.2)	
Concurrent pathological findings						
Absent	2	35	15	18	70 (39.1)	0.720
Present						
One	5	27	15	31	78 (43.6)	
Two	1	11	7	8	27 (15.1)	
Three	0	2	1	1	4 (2.2)	

Note: [a] Pearson's chi-square and Fisher's exact test; * Statistically significant (p < 0.05)

DISCUSSION

Prevalence of hysterectomy specimens for uterovaginal prolapse

Between January 2019 and December 2021, a total of 210 hysterectomy specimens for clinically diagnosed UVP were received at the histopathology laboratory of Hospital Kuala Lumpur (HKL), representing 34% of all hysterectomy specimens received for various gynaecological conditions. A previous study by Awale et al. (2017) from a similar single-centre tertiary hospital reported a much lower proportion of 6% over a 2.5-year period (20). This notable discrepancy is likely due to differences in the volume of specimens handled, nearly 1,000 in their study compared to 614 in ours, which may reflect the impact of the COVID-19 pandemic. During the pandemic, surgical priorities were directed toward urgent and life-threatening cases, limiting elective procedures such as hysterectomy for UVP. It is important to note that the actual prevalence of UVP cases managed surgically can only be fully appreciated by accounting for the total number of patients attending the Urogynaecology clinic during the same period, including those managed conservatively.

Clinico-demographic distribution

Consistent with the known pathophysiology of pelvic organ prolapse (POP), our findings show that most patients undergoing hysterectomy for UVP are older, with 68.1% aged ≥60 years. A meta-analysis of 30 previous

studies involving developing countries demonstrates that age and parity are both significantly associated with the prevalence of POP (4). As age and parity increase, the incidence and prevalence of POP also rise. A more recent study shows that the prevalence reaches as high as 70.1% in women aged 55 years and above, with more than 50% of patients being para 5 or higher (3). Both studies included parity, which was not available in this cohort due to a lack of information in most cases. Although UVP has been reported in patients younger than 30 years old (1), we do not see patients under the age of 42, likely due to the growing preference for conservative or uterine-sparing approaches in younger women to preserve fertility. Advances in uterine-preserving surgeries may also contribute to this trend, enabling women with symptomatic prolapse to avoid hysterectomy.

Ethnic distribution data in our study reflect the demographics of Malaysia, where Malays make up more than 60% of the population. However, to our knowledge, this is the first study to assess UVP-related hysterectomy cases by ethnicity. The predominance of Malay patients (45.8%), followed by Indians and Chinese, may be influenced by population proportions and sociocultural factors, including attitudes toward surgery, health-seeking behaviour, and access to care. Differences in cultural practices, levels of health literacy, and stigma around pelvic floor disorders could also influence these patterns. Further studies incorporating detailed sociodemographic data are warranted to explore these disparities.

Interestingly, stage 2 UVP was the most common indication for hysterectomy in our cohort (41.9%), despite expectations that more advanced stages would be predominant. The finding differs from a study by Kulkani et al (2020), where the majority of their cases were in stage 3 (61.2%), followed by stage 2 (31.6%) (1). This suggests that the decision to proceed with surgery is not solely based on the anatomical stage of uterine descent. Instead, it likely reflects the broader clinical picture, including other types of prolapse (e.g., cystocele, rectocele), severity of symptoms, and patient preferences. Thus, one of the limitations of our study is the absence of comprehensive clinical data, such as the degree of associated prolapse in other compartments or symptom burden, due to inconsistencies in the information provided on pathology request forms.

Concurrent pathological findings and associations

We found that 60.9% of UVP-related hysterectomy specimens had concurrent pathological findings, most of which were benign. This is consistent with previous studies that reported a wide range of frequencies, from 21% to 66% (19,20). Leiomyoma was the most common pathology in our series, present in 37.4% of cases. Although this is slightly lower than Yin et al.'s report of 50% (20), our findings reaffirm the predominance of benign uterine conditions in this setting.

Premalignant lesions were rare (0.6%), and no malignancies were detected, supporting previous literature that questioned the necessity of routine histopathological examination of these specimens. Nonetheless, a slightly higher proportion (2.6% and 4.2%) of premalignant and malignant uterine pathology was reported in two studies, with two cases (0.3%) having endometrial carcinoma and one case (0.3%) having cervical carcinoma (16,17). The current data support ongoing pathological review of UVP-related hysterectomy specimens, especially in settings where uterine-conserving surgery is becoming more common. A significant association was observed between ethnicity and the presence of concurrent pathologies ($p = 0.029$), with Indian (72.5%) and Malay (63.4%) women exhibiting the highest rates. This may reflect underlying genetic, environmental, or behavioural factors and warrants further investigation. As mentioned earlier, this is the first study to assess UVP-related hysterectomy cases by ethnicity, and no comparison has been made with other studies. No significant association was found with age or stage of UVP, which aligns with a study on the association of premalignant or malignant uterine pathology that showed no significant difference in incidence according to age, BMI, and UVP stage (21). Another study showed women with premalignant or malignant uterine pathology were found to be older than women with benign pathology (mean age: 67.0 ± 10.7 years vs 59.5 ± 12.0 years, respectively; $P = .01$) and were more likely to be postmenopausal (16). This cohort generally showed that concurrent pathology is mostly present in older age groups, with one premalignant case aged 74. Future research could also examine variables such as diet, body mass index, parity, and comorbidities, which may vary across ethnic groups and influence disease prevalence.

As expected, there was a significant association between advanced age and higher UVP stage ($p = 0.026$), consistent with the underlying pathophysiology of uterine prolapse due to the weakening of the supporting structures of the pelvic floor seen in menopausal age, as estrogen levels decline. Increasing age was found to be a significant risk factor for POP, with relative risks of 1.09 ($P < 0.001$) (6). The finding is also supported by a study that showed a significant difference in the degree of uterine prolapse with age ($p = 0,016$) and obesity ($p = 0,041$) (22). However, in relatively younger patients who presented with a higher stage of uterine prolapse, other intrinsic and extrinsic risk factors such as inherent connective tissue disorder, history of pelvic or abdominal surgery, or the number of vaginal deliveries contributing to the weakening of the pelvic floor muscle must be considered. There was no significant association between the stage of uterine prolapse and ethnicity or concurrent pathological findings, suggesting that the severity of prolapse was not associated with the

likelihood of detecting concurrent uterine lesions or ethnicity.

One key limitation of our study is the lack of detailed clinical data, such as menopausal status, abnormal uterine bleeding, or findings from preoperative screening, which have been explored in more comprehensive studies such as that by Frick et al. (2010) (16). Including such data would enable a more nuanced risk assessment and improve clinical decision-making.

CONCLUSION

This study confirms that although UVP is a benign condition, a substantial proportion of hysterectomy specimens show concurrent pathological findings, most of which are benign, with rare premalignant lesions and no malignancies detected. These results emphasise the importance of routine histopathological evaluation to identify clinically relevant conditions that might otherwise go unnoticed, especially in an era increasingly favouring uterine-conserving surgical approaches. The need for thorough preoperative assessment is also important, particularly in asymptomatic postmenopausal women, even though the incidence of concurrent premalignant and malignant pathologies remains low.

The significant association between concurrent pathologies and ethnicity, as well as between age and UVP stage, reinforces the need to consider demographic factors during clinical assessment and decision-making. These insights can aid in improving surgical planning, risk stratification, and patient counselling.

Future prospective studies that include comprehensive clinical data such as parity, menopausal status, previous obstetric and gynaecological history, and symptom burden are recommended to further improve patient management strategies and achieve the best outcomes.

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