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Inherited Perspiration, Acquired Liberation: Institutional Case Series of VATS Sympathectomy for Familial Primary Hyperhidrosis Across Generations

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Abstract **Case Report**

Primary hyperhidrosis is a chronic, benign, yet socially disabling disorder, most commonly affecting the palms, axillae, and soles. It is believed to result from sympathetic overactivity and shows strong familial clustering, with autosomal dominant inheritance and variable penetrance. Despite being non-life-threatening, it significantly impacts quality of life, limiting interpersonal interactions, academic performance, occupational productivity, and psychological well-being. Video-assisted thoracoscopic sympathectomy (VATS) is the gold-standard treatment for severe cases refractory to conservative management, providing immediate symptom resolution and high long-term success rates. However, reports documenting familial patterns across different ethnicities over extended periods remain limited. ***Materials and Methods:*** We present a combined institutional experience spanning 15 years involving two sibling pairs. *Historical cohort (2010):* Two Chinese siblings (15 and 17 years) with disabling palmar and plantar hyperhidrosis underwent bilateral VATS sympathectomy (T2–T4). Both achieved immediate and sustained symptom resolution at 12 months, with no compensatory hyperhidrosis or major complications. *Contemporary cohort (2025):* Two Malay brothers (21 and 23 years) presented with lifelong severe palmar and plantar hyperhidrosis (Hyperhidrosis Disease Severity Scale (HDSS) 4/4), unresponsive to topical therapy and lifestyle measures. Both underwent bilateral VATS sympathectomy (T2–T4, with nerve of Kuntz division when present), achieving immediate dryness, early discharge, and marked improvement in quality of life. Neither developed Horner's syndrome, pneumothorax, or early compensatory hyperhidrosis. ***Results/Discussion:*** This series highlights the familial and likely genetic nature of hyperhidrosis across ethnicities. Prevalence estimates range from 0.6–5%, with 30–65% of patients reporting a positive family history. Beyond physical discomfort, hyperhidrosis contributes to social withdrawal, anxiety, and reduced confidence. Both historical and contemporary cases demonstrate that VATS sympathectomy is reproducible, durable, and highly effective (>95% immediate success in large series), with minimal complications when performed in specialized centers. Spanning two generations and distinct ethnic groups, this experience underscores consistent efficacy and supports careful level selection (T2–T4) to minimize compensatory sweating, although long-term surveillance is needed. ***Conclusion:*** Familial hyperhidrosis warrants early recognition, counseling, and timely surgical referral when conservative measures fail. This combined case series illustrates that VATS sympathectomy is a safe, minimally invasive, and transformative intervention, providing lasting symptom relief and improved quality of life across generations and ethnic backgrounds.

Keywords: Primary hyperhidrosis, Video-assisted thoracoscopic sympathectomy (VATS), Familial inheritance, Quality of life, Ethnicity, Case series.

INTRODUCTION

Primary hyperhidrosis is a chronic disorder characterized by excessive sweating beyond physiologic or thermoregulatory requirements. Although benign in nature, the condition is often profoundly disabling, particularly when it involves the palms, soles, and axillae—the most commonly affected anatomical sites. Patients frequently experience significant functional and psychosocial impairment, including difficulty with handwriting or manual tasks, limitations in professional and social interactions, and heightened levels of embarrassment, anxiety, and reduced self-esteem. These

consequences are especially pronounced when the condition manifests during childhood or adolescence, a period when social development and academic performance are highly sensitive to external stressors.

A substantial body of literature supports a strong genetic component in primary hyperhidrosis, with familial clustering documented in 30–65% of individuals. The pattern of inheritance is frequently described as autosomal dominant with incomplete and variable penetrance, suggesting a heritable predisposition influenced by yet-undefined genetic and environmental modifiers. Familial cases often present earlier, display more severe phenotypes, and involve multiple anatomical regions, underscoring the importance of early recognition and counseling in affected families. Despite this, published data capturing the longitudinal and cross-generational nature of hyperhidrosis within families—particularly across diverse ethnic backgrounds—remain limited.

Initial management consists of conservative therapies such as topical aluminum chloride, oral anticholinergics, iontophoresis, and botulinum toxin injections. However, these approaches frequently yield only partial, temporary, or poorly tolerated results, with many patients experiencing persistent symptoms that significantly interrupt daily functioning. For individuals with severe, refractory disease, surgical interruption of the sympathetic chain via video-assisted thoracoscopic sympathectomy (VATS) has emerged as the gold-standard therapeutic option. Numerous large institutional series have demonstrated its efficacy, with reported immediate success rates exceeding 95% and sustained long-term improvement in quality of life. When performed in specialized centers, the procedure carries low morbidity, short hospital stays, and rapid postoperative recovery, making it an attractive and durable solution for appropriate candidates.

Despite robust evidence supporting familial predisposition and the effectiveness of VATS sympathectomy, there remains a paucity of published reports documenting multi-generational or cross-ethnic familial cases managed within a single institution over extended periods. Such experiences provide valuable insight into phenotype variability, surgical reproducibility, and long-term outcomes within hereditary patterns of disease.

In this context, we present a unique 15-year institutional case series involving two sibling pairs from different ethnic backgrounds—Chinese siblings treated in 2010 and Malay brothers treated in 2025—who underwent bilateral VATS sympathectomy for severe primary hyperhidrosis. This series highlights the hereditary nature of the condition, demonstrates the consistency and durability of VATS sympathectomy outcomes across generations, and adds to the limited body of literature documenting familial hyperhidrosis in diverse populations.

CASE PRESENTATION

Historical Sibling Pair (2010)

The first familial presentation involved two Chinese siblings, aged 15 and 17, who were referred in 2010 for lifelong, debilitating palmar and plantar hyperhidrosis. Both reported severe functional limitations, including difficulty gripping writing instruments, frequent dropping of objects, and social embarrassment that affected school participation. Neither sibling had significant comorbidities, and both reported a strong paternal family history of excessive sweating.

Clinical evaluation confirmed HDSS scores of 4/4 in both patients, with symmetrical palmar and plantar involvement and no secondary causes identified. Conservative therapies—topical aluminum chloride, lifestyle modification, and iontophoresis—had been attempted for several years with minimal benefit.

Both siblings underwent bilateral VATS sympathectomy (T2–T4) under general anesthesia. The procedures were completed without intraoperative complications, and no anatomical variants such as the nerve of Kuntz were encountered. Both patients achieved immediate postoperative dryness, with no evidence of pneumothorax, Horner's syndrome, or early compensatory hyperhidrosis. They were discharged on postoperative day 1. At 12-month follow-up, both reported complete and sustained symptom resolution, marked improvement in confidence and social participation, and no delayed complications.

Contemporary Sibling Pair (2025)

The second familial cluster involved two Malay brothers, aged 21 and 23, treated in 2025. Both presented with lifelong severe palmar and plantar hyperhidrosis, first noticed in early childhood and progressively worsening over adolescence. Their symptoms significantly impaired daily functioning, particularly academic tasks, interpersonal interactions, and employment performance. Similar to the historical cohort, both reported multiple affected family members, including their father and paternal aunt.

On examination, both demonstrated HDSS 4/4 palmar sweating with cool, moist extremities and positive starch–iodine tests confirming diffuse palmar involvement. They had previously tried topical antiperspirants, oral glycopyrrolate, and lifestyle adjustments without meaningful relief.

Both brothers underwent bilateral VATS sympathectomy (T2–T4), with division of the nerve of Kuntz when present. Intraoperative findings included normal thoracic anatomy, and the procedures were completed smoothly with minimal blood loss. Immediate

postoperative dryness of the palms and soles was achieved in both cases. Neither brother developed pneumothorax, Horner's syndrome, neuropathic pain, nor early compensatory hyperhidrosis. Both were discharged within 24 hours and reported dramatic improvement in quality of life during early outpatient follow-up.

Summary

Across two generations and two distinct ethnic backgrounds, all four siblings demonstrated a consistent phenotype of early-onset, severe primary hyperhidrosis with strong familial clustering. In every case, bilateral VATS sympathectomy (T2–T4) provided immediate, reproducible, and durable symptom relief without significant complications, reinforcing the hereditary nature of the disorder and the role of VATS sympathectomy as a definitive intervention for refractory cases.

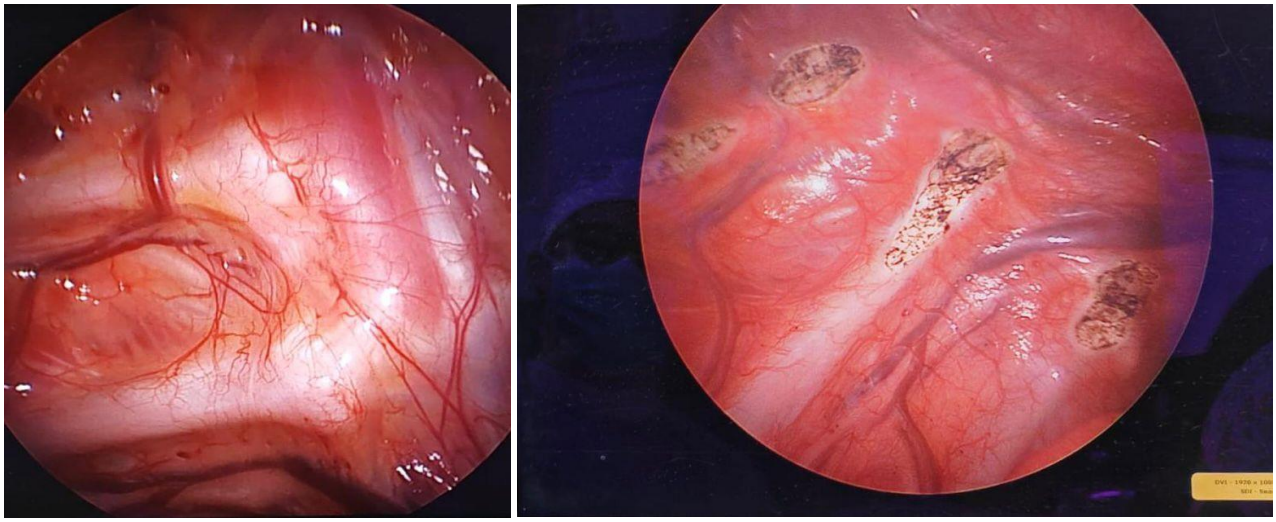

Figure 1: Sympathetic trunk identified running vertically over the rib heads. Clear visualization of T2–T4 ganglia and the accessory nerve of Kuntz

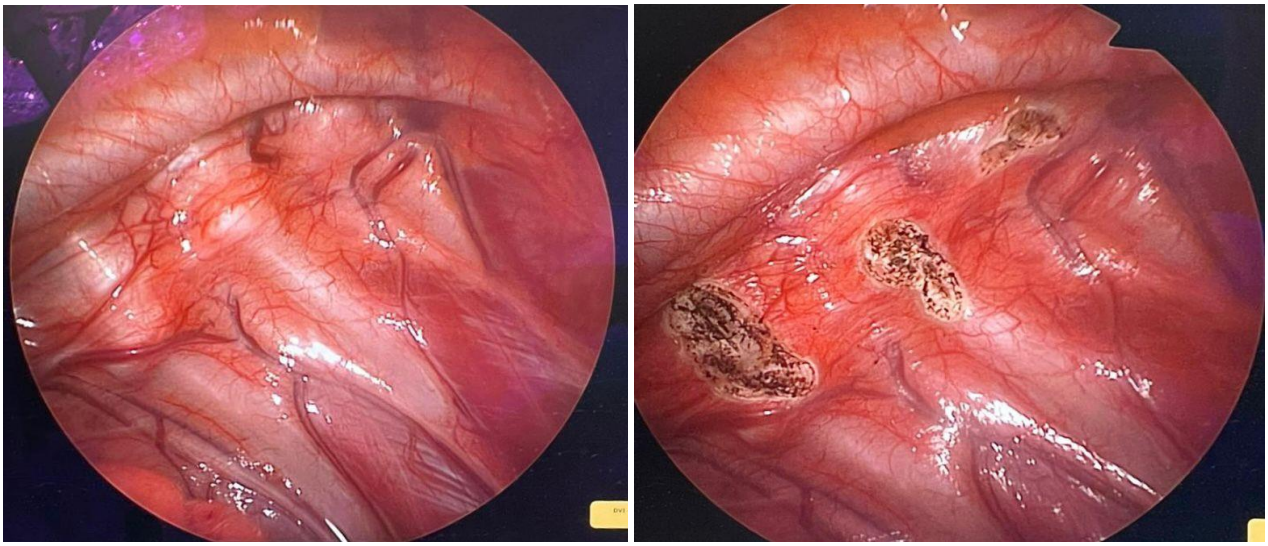

Figure 2: The T2–T4 ganglia are identified, and meticulous division is performed using electrocautery, ensuring complete interruption of the nerve fibers and the accessory Kuntz nerve when present. The deflated left lung provides excellent exposure of the posterior chest wall, intercostal spaces, and the rib heads, allowing precise and safe dissection

DISCUSSION

This case series highlights the safety, reproducibility, and effectiveness of VATS sympathectomy for primary hyperhidrosis, particularly in patients with a clear familial pattern. The synchronous presentation in two sibling pairs underscores the strong genetic predisposition associated with the condition, reinforcing the importance of early recognition, counseling, and timely referral for definitive management.

Genetic and Familial Aspects

Familial clustering in primary hyperhidrosis is well documented, with up to 50% of patients reporting a positive family history [1]. The condition is commonly described as following an autosomal dominant inheritance pattern with variable penetrance, although the precise genetic mechanism remains incompletely understood. Rather than structural abnormalities, many authors suggest that the underlying defect lies in dysregulated sympathetic ganglia activity leading to exaggerated sudomotor responses [5].

The presentation of two sibling pairs in this series—15 years apart yet sharing nearly identical symptom severity and anatomical distribution—aligns with the literature supporting hereditary transmission. These findings highlight the importance of routinely assessing family history when encountering young patients with severe, early-onset hyperhidrosis.

Effectiveness of VATS Sympathectomy

VATS sympathectomy is widely regarded as the most effective long-term treatment for severe palmar hyperhidrosis. Li et al. [3], in their landmark study of 2006 patients, reported a 98% rate of immediate symptom resolution. Hofferberth et al. [4] further demonstrated sustained improvement in symptom control and quality of life in adolescent and young adult cohorts, with follow-up extending up to 10 years. A comprehensive meta-analysis by Deng et al. [6], incorporating data from more than 39 studies, reinforced VATS sympathectomy as the superior treatment modality for durable relief.

The outcomes observed in our patients mirror these results. All four individuals experienced immediate and complete cessation of palmar and plantar sweating, with rapid discharge and no early complications. The consistency of outcomes across two generations and two ethnic groups supports the robustness of the standardized T2–T4 sympathectomy technique, even in resource-limited or variable practice settings.

Complications and Risk Mitigation

Compensatory hyperhidrosis (CH) remains the most common postoperative concern, with an incidence reported between 20–60% depending on patient factors and the extent of sympathetic chain ablation [7]. Although typically less disabling than primary hyperhidrosis, severe CH can negatively impact patient satisfaction. Several authors advocate for limiting interruption to specific levels such as T2–T3 or T3–T4 to reduce CH while maintaining therapeutic efficacy [8].

In our series, all patients underwent T2–T4 sympathectomy with selective division of the nerve of Kuntz where present. None developed early CH, though long-term follow-up remains essential as CH may manifest months after the procedure. Other complications—pneumothorax, hemothorax, Horner's syndrome, and intercostal neuralgia—were not observed, reflecting the safety of the minimally invasive approach when executed by experienced surgeons.

Psychosocial Outcomes

Hyperhidrosis extends beyond physical discomfort, exerting a profound psychosocial impact. Up to 90% of affected individuals report emotional distress, and nearly half experience functional impairment at school or work [2]. VATS sympathectomy has consistently been shown to enhance psychological well-being, social confidence, and overall quality of life [9].

Both sibling pairs in our series reported significant improvements in daily functioning, including social interactions, academic performance, and perceived self-confidence—consistent with findings from De Campos et al. [10], who documented substantial improvements in validated quality-of-life scores following sympathectomy.

Uniqueness of This Case Series

Reports of siblings undergoing VATS sympathectomy during the same operative period are scarce. This institutional case series is unique in spanning two generations and two ethnic backgrounds, providing a rare longitudinal and cross-cultural perspective on the hereditary nature of hyperhidrosis. The consistent and favorable outcomes observed in genetically related individuals further support both the reproducibility of the surgical technique and the strong familial basis of the condition.

CONCLUSION

Familial primary hyperhidrosis, although benign, carries profound psychosocial and functional consequences that can severely impair daily life, particularly among young individuals. Early identification—supported by a detailed family history—remains essential to ensure appropriate counselling and timely escalation from conservative therapies to definitive surgical management. Our institutional experience, now extending over 15 years and encompassing patients from different ethnic backgrounds and two distinct sibling pairs treated more than a decade apart, highlights the consistency, safety, and durability of VATS sympathectomy as an effective solution for severe, refractory disease. The immediate and sustained resolution of palmar symptoms observed in both sibling cases not only underscores the strong heritable component of the condition but also reinforces the transformative impact of surgical sympathectomy on patient quality of life. These findings support VATS sympathectomy as the treatment of choice for appropriately selected patients and affirm its reproducible therapeutic benefits across generations.

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