Case Report

Hidden Risks Unearthed: A Case of von Willebrand Disease Overlooked by Automated Preoperative Screening

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ABSTRACT

The rise of standardized self-assessment tools and AI-driven preoperative evaluations lacks full acknowledgment of their limitations. A male patient with gynecomastia developed a hematoma post-liposuction and subcutaneous mastectomy, revealing undisclosed von Willebrand Disease. Thorough in-person anamnesis surpasses self-administered questionnaires by capturing implicit cues and deeper patient insights.

KEYWORDS
Self-administered health questionnaire; Litigation in surgery; Anamnesis questionnaire; Artificial intelligence

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INTRODUCTION

Precise communication of intricate details between surgeons and patients is essential in plastic surgery; nevertheless, time constraints often hinder a thorough information exchange[1]. In the surgical setting, the acquisition of the medical history through surgeons and anesthesiologists is usually redundant and yet incomplete[2].

A well-designed structured self-administered health questionnaire is a reliable and fundamental tool to evaluate patients preoperatively. Self-assessment questionnaires have become ubiquitous in healthcare and the interest in delegating assessments to AI has grown exponentially since the launch of ChatGPT in November 2022[1], particularly in fields like neurosurgery, radiology, cardiology[3], and plastic surgery[1]. It has been argued that AI-driven chatbots like ChatGPT could improve patient consultations, offering precise information regarding aesthetic procedures, their associated risks, benefits, and potential outcomes[4].

In an effort to curb the escalating costs in healthcare systems, traditional patient-clinician interactions are being substituted with self-assessment questionnaires, and potentially in the near term, by AI-powered anamnesis. It is imperative to consider whether this digital evolution comes with a complete absence of risks.

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CASE PRESENTATION

A 22-year-old male patient with grade IB gynecomastia (Rohrich's classification[5]) (Figure 1) presented in an outpatient aesthetic clinic. Preoperatively, he completed a self-administered health questionnaire for preoperative risk stratification (Table 1), designed by a multi-disciplinary team to assess mental and physical health and identify surgical risk factors. It covers demographic, occupational, allergy, and infectious disease data and permits skipping irrelevant questions to prevent survey fatigue and ensure information quality.

Conscious sedation surgery with intercostal block involved tumescent solution infiltration, power-assisted liposuction, and subcutaneous mastectomy. The nipple-areola complex relocation to the fourth intercostal space[6] yielded a natural look. Surgery was uneventful and led to discharge 6 hours later with no hematoma signs.

During the postoperative call that evening, the patient expressed concerns about uneven breast size. Examination revealed a unilateral hematoma (Figure 2), prompting operative revision 13 hours postoperatively. Upon further personal inquiry regarding prior surgical procedures and subsequent complications, the patient disclosed experiencing a significant hemorrhage following a circumcision performed one year earlier. Approximately 200 mL of hematoma was drained, and a 7-day antibiotic prophylaxis was initiated. Drains extracted 120 mL and were removed after 5 days.

A hemostasiological evaluation uncovered von Willebrand disease type 1. At 10-week follow-up, wound healing was satisfactory (Figure 3). Honest reporting on the self-administered health questionnaire could have prevented this complication.

DISCUSSION

To our knowledge, this article is the first to present a self-administered health questionnaire (Table 1) that aims at increasing the safety of surgical patients and discussing the shortcomings of structured and standardized preoperative risk assessment.

Checklists serve as structured prompts designed for professionals knowledgeable about the critical points involved. Specifically, surgical checklists like the World Health Organization Surgical Safety Checklist (WHO SSC) and the Surgical Patient Safety System (SURPASS) are robust instruments proven to decrease complications during hospital stays[7–10], minimize the need for urgent interventions, and lower the rate of readmissions[7]. Similarly,



Figure 1 (A and B): Twenty-two-year-old patient with bilateral symmetric gynecomastia grade I B according to Rohrich's classification

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Table 1: Questions from the structured self-administered health questionnaire.

The following health questionnaire is **for your safety**. Please answer the following questions conscientiously and completely. We need this information to be able to identify early any risks in order to take better preventive action. Please note that health hazards may arise if you provide incorrect or incomplete information. We will be happy to help you if necessary. The information provided is subject to medical confidentiality.

Please read each question and then check the answer that best describes your situation. If you are unsure of the answer to a question, choose the answer that is closest to the facts. Some questions give you the opportunity to write an answer in your own words. Please answer all questions. For certain answers, we ask you to skip the subsequent questions with the note: "Please proceed to question no. XY".

1 What's your height? ☐☐☐ cm

2 How much do you weigh? Please indicate your **body weight** rounded to whole kilograms, weighed in light daytime clothing without shoes.

☐☐☐

3 Has your **body weight** changed by more than 5 kilograms in the last 6 months?

☐ Yes ☐ No

4 Are you currently taking any **medications** (blood thinners, pain medications, cardiovascular medications, hormone medications, or other)?

☐ Yes ☐ No. Please proceed to question no. 6

5 Please list the names of the **medications** they are taking, dosage, intervals, and reason.

Medication	Dosage	In the morning	At noon	In the evening	At night	When needed	Reason
		☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	
		☐	☐	☐	☐	☐	

6 Are you currently taking any **supplements** or **vitamins**?

☐ Yes ☐ No. Please proceed to question no. 8

7 Please indicate which of the following **dietary supplements you are taking**.

☐ Vitamin A ☐ Vitamin E

☐ Ginkgo Biloba ☐ Preparations with omega-3 fatty acids, e.g. Omacor®.

☐ Green tea ☐ Echinacea

☐ Garlic capsules ☐ Preparations of St John's Wort (z.B. Felis®, Jarsin®, Laif®, Remifemin®)

☐ Other: .....

8 Have you ever had a vascular occlusion due to a blood clot (e.g. pulmonary embolism, leg vein thrombosis or stroke)?

☐ Yes ☐ No. Please proceed to question no. 10

9 When were you diagnosed with a vascular occlusion caused by a blood clot (e.g., pulmonary embolism, leg vein thrombosis, or stroke)?

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☐☐☐☐ / ☐☐ Calendar year/month

10 Has a first-degree relative of yours (parent, sibling, or child) been diagnosed with vascular occlusion due to a blood clot (e.g., pulmonary embolism, leg vein thrombosis, or stroke)?

☐ Yes ☐ No

11 Do you have an **infectious disease** such as hepatitis, HIV/AIDS or tuberculosis?

☐ Yes ☐ No. Please proceed to question no. 13

12 When were you diagnosed with the infectious disease?

☐☐☐☐ / ☐☐ Calendar year/month

13 Have you ever experienced **scarring** (keloid)?

☐ Yes ☐ No. Please proceed to question no. 15

14 When has scarring (keloid) occurred before?

☐☐☐☐ / ☐☐ Calendar year/month

15 Do you have any **allergies**?

☐ Yes ☐ No. Please proceed to question no. 17

16 What are you allergic to?

☐ Latex (rubber) ☐ Antibiotics (e.g. penicillin)

☐ Iodine ☐ Nickel

☐ Disinfectants ☐ Anaesthetics

☐ Other: .....

17 Have you ever undergone **surgery**? ☐ Yes ☐ No. Please proceed to question no. 20

18 Which **surgeries** have you already had?

Surgery:	Calendar year:	Surgery:	Calendar year:
☐ Appendix surgery	☐☐☐☐	☐ Intervertebral disc surgery	☐☐☐☐
☐ Inguinal hernia surgery	☐☐☐☐	☐ Thyroid surgery	☐☐☐☐
☐ Gallbladder surgery	☐☐☐☐	☐ Eye surgery (e.g. LASIK)	☐☐☐☐

☐ Other: .....

19 Did you experience increased or persistent bleeding during or after surgery? ☐ Yes ☐ No

20 **Do you smoke or have you ever smoked?**

☐ Yes ☐ No. Please proceed to question no. 27

21 What do you smoke? Please select only one option:

☐ Tobacco cigarettes ☐ E-cigarettes ☐ Cigar ☐ Pipe

22 When did you start smoking regularly?

Calendar year: ☐☐☐☐

23 Do you still smoke?

☐ Yes. Please proceed to question no. 25 ☐ No

24 When did you stop smoking?

Calendar year: ☐☐☐☐

25 On average, how many tobacco cigarettes / e-cigarettes / cigars did you smoke per day? Please select only one option:

☐ 0-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ More than 20

26 Do you use tobacco in any other way?

☐ Yes ☐ No

27 How often do you drink **alcoholic beverages** (wine, beer, etc.)? Please select only one option.

☐ Never / Almost never ☐ About 2 to 3 times a week

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☐ About once a month ☐ Daily/ Almost daily
☐ About once a week

28 Which life situation currently applies to you? Please select only one option.

- ☐ Full-time employed
- ☐ Part-time employed
- ☐ Partial retirement (regardless of whether in the working or release phase)
- ☐ Marginally employed, 400-euro job, mini-job
- ☐ Occasionally or irregularly employed (seasonal worker, temporary employee)
- ☐ Vocational training/Apprenticeship
- ☐ Retraining
- ☐ Military service / civilian service / voluntary social year
- ☐ Maternity leave, parental leave, other leave of absence
- ☐ Never been employed — Please proceed to question no. 31
- ☐ Currently not employed (housewife, job-seeker/unemployed, early retiree, pensioner without additional income, pupil, student) — Please proceed to question no. 31
- ☐ Currently unable to work for health reasons (sick leave)

29 What is your **main occupation** at present?

_____

30 Have you been unable to work (on **sick leave**) for more than 4 weeks in the last 12 months?

☐ Yes ☐ No. Please skip question no. 31

31 Please state the reason for the **inability to work**.

.....



Figure 2: Unilateral hematoma thirteen hours after the power-assisted liposuction and subcutaneous mastectomy.

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Figure 3 (A and B): Postoperative result at 10-week follow-up after the hematoma evacuation

questionnaires provide a systematic and thorough approach to inquiry at a time when physicians face challenges in delivering optimal patient care due to time constraints[11] and limited resources[12]. A meticulous patient anamnesis and preoperative evaluation help in tailoring treatment strategies.

Written self-administered health questionnaires have both benefits and disadvantages. They improve the efficiency of the physicians' time[13] and are a comprehensive and reliable tool for recording patients' anamnesis[13]. Digital self-administered health questionnaires improve the quality of patients' records[14]. Questionnaires minimize misreporting of anamnestic facts in comparison to a verbal patient interview[15], as they provide patients with the freedom to express themselves openly without the fear of embarrassment inherent in direct interactions[15]. However, this assertion is evidently only partly true, as illustrated by the presented case. The lack of human engagement might lead to diminished patient motivation in providing precise and mindful responses about surgical risk factors. This limitation will also extend to AI software, which will be used to take a medical history in the foreseeable future.

Several factors can adversely affect the reliability and accuracy of the anamnesis. Social desirability bias can contribute to misreporting, influenced by societal expectations and norms[16]. Surgeons must be aware of the risk of recall bias and response bias, especially regarding sensitive or embarrassing medical information[17,18]. Patients may also reveal imprecise information unconsciously, as the order and formulation of the questions may modulate the interpretation of the same[15]. Besides, other elements affect the accuracy of the collected anamnestic information, for instance, age, educational level, and professional background[14].

Despite exhaustive efforts, these limitations persist, posing a residual risk to the patient. Nonetheless, physicians cannot be deemed negligent if they can demonstrate diligent attempts to acquire pertinent information. In instances where doctors opt not to utilize such questionnaires, they may face accusations of negligently subjecting the patient to unforeseeable risks. However, this case illustrates the importance of cross-checking questionnaire

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responses against a succinct personal anamnesis. ChatGPT can significantly contribute to augmenting physicians' knowledge and aiding in decision-making processes[19], as well as gather medical information through conversational interactions with patients. Nonetheless, for patients with intricate medical backgrounds, essential information—particularly non-verbal cues—may surpass the perception capabilities of artificial intelligence[3]. It is imperative to preserve the physician-patient relationship, provide empathetic support, address patient concerns, and customize treatment plans accordingly. Besides, legal ethical concerns have emerged concerning the confidentiality and security of sensitive patient data, underscoring the importance of informing patients about ChatGPT's data usage and obtaining their informed consent[19]. Other legal factors to consider include the reliability of information derived from ChatGPT[1,19], which could lead to serious medical errors[19]. Therefore, the best anamnesis is still the personal questioning of the patient by the doctor, which is very time-consuming. A simply formulated and well-structured self-administered health questionnaire is a fundamental pre-surgical evaluation tool to improve the completeness of anamnesis, thereby minimizing the risks involved surgical procedures, optimizing physicians' time. Knowledge of the test-retest reliability and validity certainly adds to the quality of a clinical questionnaire but requires considerable time and effort and should not prevent the use of a systematic risk assessment questionnaire. The surging popularity of ChatGPT emphasizes the necessity for stringent regulations and licensing to ensure patient safety, ethical standards, and legal compliance. Its integration into healthcare must undergo rigorous ethical scrutiny to safeguard individuals' well-being[19]. Nevertheless, amidst these advancements, it is imperative to acknowledge and preserve the indispensable human qualities of empathy, compassion, and individualized care[4].

CONCLUSION

This case of von Willebrand Disease missed by automated preoperative screening serves as a critical reminder of the indispensable yet imperfect nature of such assessments in patient evaluations. While these tools play a significant role in enhancing patient safety, their limitations must be acknowledged. Maintaining a delicate equilibrium between leveraging AI technologies and upholding the human touch is essential in upholding the highest standards of care in aesthetic medicine. We call upon healthcare professionals to exercise a balanced approach when utilizing these technologies, ensuring a combination of automated efficiency and human oversight. Further research and training in the effective use of AI in patient assessments are imperative to minimize risks and improve surgical outcomes.

CONSENT FOR PUBLICATION

Written informed consent for publication of this article was obtained from the patient.

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COMPETING INTERESTS

The authors declare no conflicts of interest with respect to the research, authorship, and/or publication of this article.

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