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The Role of Tashrīḥ-ul-Badan (Anatomy) in the Unani System of Medicine: Historical Foundations, Clinical Applications, and Contemporary Relevance

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Abstract

***Background*:** Tashrīḥ-ul-Badan (anatomy) occupies a foundational position in the Unani system of medicine. Although the anatomical framework of this system is rooted in classical Greek traditions, it has undergone significant expansion, empirical critique, and refinement within the Greco-Arabic medical paradigm during the Islamic Golden Age. ***Objective*:** This study systematically examined the historical evolution of anatomical knowledge within the Unani system of medicine by analyzing how classical texts prescribed the operationalization of this knowledge in diagnostic reasoning, therapeutic interventions, and surgical procedures. ***Methods*:** This study employed a structured qualitative historical review methodology underpinned by systematic textual analysis of classical Greco-Arabic medical literature. The systematic nature involved defined criteria for primary source selection, a multi-stage content analysis framework including open coding and thematic synthesis, and a comparative evaluation strategy to ensure robust interpretation. ***Findings*:** The analysis revealed three interrelated themes concerning Tashrīḥ-ul-Badan: foundational Greek influence, critical refinement by Arabic physicians, and continuous integration into diagnostic and surgical practice. Evidence from the literature demonstrates how historical scholars have envisioned anatomical knowledge that actively guided clinical reasoning and operative procedures. ***Conclusion*:** Canonical texts meticulously prescribed Tashrīḥ-ul-Badan as an operational clinical science rather than a static theoretical discipline. This advanced anatomical framework was designed to directly inform diagnostics, therapeutic strategies, and surgical interventions, highlighting the profound clinical sophistication championed by Greco-Arabic medical scholarship. This demonstrates a commitment to anatomically informed practice that resonates with the spirit of rigorous clinical anatomy in modern medicine, despite differing methodologies and technological capabilities.

Keywords: Unani system of medicine; Tashrīḥ-ul-Badan; anatomy; Greco-Arabic medicine; medical history; and historical surgical anatomy.

1. INTRODUCTION

The Unani system of medicine evolved through a sophisticated synthesis of classical Greek medical paradigms with the expansive intellectual traditions of the Islamic Golden Age. The foundational theories established by Hippocrates [1] and Galen [2] were meticulously preserved, translated, critically evaluated, and subsequently expanded by physicians operating

within the Greco-Arabic scientific tradition during the Islamic Golden Age between the 8th and 13th centuries [3].

Within this robust intellectual framework, the study of anatomy, referred to in the Unani System of Medicine as tashrīḥ-ul-badan, was elevated to a core discipline. Classical physicians consistently emphasize that an intimate understanding of human anatomy is an absolute prerequisite for comprehending physiology, diagnosing complex pathologies, and executing precise therapeutic interventions [4].

The earliest systematic exploration of anatomical sciences originated in Greek medicine. Hippocratic writings prioritized empirical observations and rational deductions of disease processes [1]. Galen subsequently constructed an exhaustive anatomical framework that intrinsically links structural morphology with physiological functions [2]. His extensive treatises have served as an undisputed anatomical authority in both Islamic and European medical traditions for over a millennium [3].

During the translation movement of the Islamic Golden Age, these Greek medical texts were rendered into Arabic, serving as a catalyst for further scientific inquiry. Modern historians of science have extensively documented how this era was characterized not only by the preservation of classical knowledge but also by its active transformation [5]. Renowned physicians such as Ibn Sīnā, al-Zahrāwī, and Ibn al-Nafīs significantly propelled anatomical science forward through a combination of rigorous scholarly critique and empirical clinical observation. While direct evidence of systematic human dissection for discovery remains a subject of ongoing historical debate, these empirical observations were likely derived from extensive surgical experience, the management of complex trauma, and the careful correlation of clinical symptoms with underlying anatomical structures.

Ibn Sīnā's magnum opus, Al-Qānūn fī al-Ṭibb (The Canon of Medicine), masterfully synthesized existing medical theories, becoming the preeminent medical text of the medieval Islamic world [4]. Concurrently, al-Zahrāwī's landmark surgical encyclopedia, Kitāb al-Taṣrīf, detailed an array of complex surgical instruments and operative techniques that demanded exact topographical precision [6]. A watershed moment in anatomical history occurred when Ibn al-Nafis challenged established Galenic cardiology and accurately described pulmonary circulation—a discovery that underscores the dynamic, evidence-based nature of anatomical investigation during the Islamic Golden Age [7].

While modern historiography has firmly established that Greco-Arabic medicine is a sophisticated tradition marked by deep innovation [8], the specific operational role of anatomical knowledge in day-to-day clinical practice within the Unani system of medicine requires further elucidation. Consequently, this study investigated how structural anatomical knowledge was practically applied to diagnostic reasoning, therapeutic strategies, and surgical practice across classical Unani medical literature.

2. MATERIALS AND METHODS

This study utilized a qualitative historical research methodology grounded in a systematic textual analysis of classical medical literature.

2.1 Analytical Framework and Systematic Protocol:

To ensure a structured and reproducible approach, this study employed a multi-stage qualitative content analysis framework. First, primary sources were selected based on an established historiographical consensus regarding their widespread integration into the medieval medical curriculum and their recognized authority within the Greco-Arabic tradition. The inclusion criteria strictly focused on canonical texts that provided comprehensive systemic overviews or dedicated surgical treatises. Second, explicit structural anatomical descriptions were identified through targeted close reading and categorized according to anatomical regions and functional descriptions. Third, a thematic analysis was conducted to uncover implicit anatomical rationales embedded within diagnostic and therapeutic guidelines. This involved open coding of recurring surgical and regional terminology, contextualizing symptoms with their underlying anatomical explanations, and noting instances in which anatomical mastery was explicitly cited as a prerequisite for the procedure or diagnosis. Codes were then synthesized into overarching themes, such as "Topographical Precision for Surgery" and "Anatomy in Differential Diagnosis." Finally, to mitigate the interpretive bias inherent in qualitative historical research, the findings were triangulated by cross-referencing interpretations across multiple classical authors and consulting modern secondary historiographical sources to validate the historical context of these medical concepts.

2.2 Primary and Secondary Sources:

The primary corpus comprised the following foundational Greco-Arabic medical texts chosen for their unparalleled influence, comprehensive synthesis, and groundbreaking contributions to anatomical understanding and clinical application. *Primary Texts:*

- Firdaws al-Ḥikmat (Paradise of Wisdom) — Al-Ṭabarī
- Kitāb al-Manṣūrī fī al-Ṭibb (Liber Almansoris) — Al-Rāzī
- Al-Qānūn fī al-Ṭibb (The Canon of Medicine) — Ibn Sīnā
- Kitāb al-Kulliyāt (Colliget) — Ibn Rushd
- Kitāb al-Taṣrīf — Al-Zahrāwī

- Sharḥ Tashrīḥ al-Qānūn — Ibn al-Nafīs
- Kitāb al-ʿUmda fī al-Jarāḥat — Ibn al-Quff

Secondary sources included peer-reviewed historiographical studies on Greco-Arabic medicine to contextualize the primary findings and modern authoritative anatomical texts to evaluate the contemporary resonance of these historical frameworks.

3. FINDINGS

3.1 Greek Foundations of Anatomical Knowledge:

Our textual review confirms that the bedrock of anatomical conceptualization in the Unani System of Medicine is deeply anchored in classical Greek literature. Hippocratic treatises established the necessity of clinical observation and anatomical deduction as pillars of rational medical practice [1]. Galen formalized these principles into a comprehensive teleological anatomy. In his Treatise on the Usefulness of the Parts of the Body, Galen articulated the functional purpose of specific organs, linking regional anatomy directly to overarching physiological processes [2]. These classical frameworks provide an essential vocabulary for subsequent Greco-Arabic physicians.

3.2 Development of Anatomy in the Islamic Medical Tradition:

An analysis of subsequent Islamic medical literature revealed a clear trajectory from the passive preservation of Greek texts to active critical expansion. Early encyclopedic works, notably al-Ṭabarī's Firdaws al-Ḥikmat, successfully integrated classical Greek anatomical concepts into a newly synthesized Islamic medical curriculum [9].

Al-Rāzī's Kitāb al-Manṣūrī fī al-Ṭibb advanced this knowledge by integrating clinical discussions that linked specific anatomical lesions to observable disease processes, thereby enhancing the diagnostic utility of anatomy [10]. Importantly, figures like Al-Rāzī did not merely echo the inherited dogma; his extensive clinical case notes often served as an empirical critique, refining anatomical understanding based on direct, systematic patient observation and outcomes, rather than relying solely on philosophical deduction. This synthesis reached its zenith with Ibn Sīnā's Al-Qānūn fī al-Ṭibb, which masterfully mapped the structural topography of the heart, brain, and liver, explaining their systemic roles in disease pathology [4].

The most striking evidence of fundamental empirical anatomical revision is found in Ibn al-Nafīs's Sharḥ Tashrīḥ al-Qānūn. By critically re-examining the Galenic model of the heart—specifically, by refuting the existence of a porous interventricular septum—Ibn al-Nafīs utilized deductive anatomical reasoning and empirical observation to accurately propose pulmonary blood transit [7 - 13].

3.3 Surgical Applications of Anatomical Knowledge:

The literature on operative medicine provides tangible evidence for the prescribed application of Tashrīḥ-ul-Badan, outlining interventions that demanded a granular understanding of regional anatomy, even if the consistency of such application in daily practice remains subject to historical interpretation. Al-Zahrāwī's Kitāb al-Taṣrīf outlines numerous surgical interventions that would be fatal without a granular understanding of regional anatomy. In his lithotomy instructions, al-Zahrāwī stressed the absolute necessity of understanding perineal anatomy, bladder neck, and surrounding vasculature, emphasizing the importance of the midline raphe to avoid major lateral vessels [6].

Furthermore, detailed protocols for fracture reduction rely heavily on precise skeletal osteology and muscular alignment. Ibn al-Quff's surgical manual, Kitāb al-ʿUmda fī al-Jarāḥat, further illustrates the advanced application of topographical anatomy in managing complex trauma [11]. This operational necessity extended to specialized fields such as ophthalmology; comprehensive structural mapping of the eye (Tashrīh 'Ain) allowed Greco-Arabic surgeons to conceptualize delicate ocular interventions with unprecedented accuracy [15].

3.4 Diagnostic and Therapeutic Applications:

Beyond surgery, tashrīḥ-ul-badan was deeply integrated into internal medicine. Ibn Sīnā formalized the practice of regional diagnosis, where systemic symptoms were meticulously traced back to the offending organ. For instance, detailed structural mapping of the hepatobiliary tract (Nizam-E-Kabidi Wa Safrawiya) allowed physicians to physically differentiate between hepatic parenchymal disease and localized biliary obstruction based on theoretical anatomical models [14].

Routine therapeutic interventions, such as phlebotomy (venesection) and cauterization, are highly protocolized based on anatomical mapping. Practitioners are required to identify specific peripheral vessels and select the cephalic vein for head afflictions and the basilic vein for lower visceral conditions, safely differentiating these vessels from underlying nerves and arteries [12].

4. DISCUSSION

4.1 The Acquisition, Transmission, and Execution of Anatomical Knowledge:

While canonical texts firmly establish the operational role of anatomy, a notable limitation of historical textual analysis is its silence on the practical pedagogy of science. Direct evidence of systematic human dissection in the medieval Islamic world remains a subject of ongoing historical debate [8]. However, the empirical observations that drove anatomical critique and refinement likely stemmed from robust alternative avenues. These include extensive surgical experience,

management of complex trauma on the battlefield, and careful correlation of clinical symptoms with post-mortem or traumatic observations.

Furthermore, it is vital to distinguish between the idealized, prescribed standards of care authored by elite physicians and the daily realities of medieval clinical practice. The rigorous anatomical prerequisites detailed by figures such as al-Zahrāwī and Ibn Sīnā represent an aspirational zenith of Greco-Arabic medicine. While these texts prove that anatomy was conceptualized as a vital clinical tool, the extent to which average provincial practitioners successfully applied this complex topographical knowledge in everyday scenarios remains a nuanced historical question.

4.2 Contemporary Relevance and Methodological Divergence:

Recognizing the sophisticated role of anatomy in the Unani system of medicine contributes to a more nuanced understanding of global medical history. Strikingly, the rigorous demand for topographical precision championed by figures such as al-Zahrāwī and Ibn Sīnā conceptually resonates with the educational imperatives found in modern foundational anatomy texts [16-20]. Just as contemporary clinical anatomy texts emphasize the spatial relationships of neurovascular bundles for surgical safety [21-25], classical Unani texts utilized Tashrīḥ-ul-Badan to establish safe surgical corridors and precise diagnostic palpation.

However, while the spirit of applying anatomical knowledge for clinical safety and efficacy remains constant, it is crucial to acknowledge the profound methodological divergence. Unani anatomical insights were largely derived from philosophical deduction, rigorous clinical observation, the management of trauma, and animal dissection. This historical framework is fundamentally distinct from systematic human cadaveric dissection, cellular pathology, and advanced in-vivo imaging, which form the bedrock of contemporary anatomical science. Appreciating this difference highlights the remarkable ingenuity of Greco-Arabic physicians who achieved high levels of clinical reasoning without modern technological advantages.

5. LIMITATIONS

This historical review primarily relied on widely accessible printed editions and modern peer-reviewed translations of classical medical texts. Minor textual variations or marginalia present in the original, unedited manuscripts may contain nuanced anatomical insights that have not been fully captured in published volumes. As noted in the discussion, classical medical texts inherently reflect an idealized standard of care, meaning conclusions drawn about the "operationalization" of anatomy apply primarily to the intellectual frameworks of the era's leading scholars rather than the guaranteed daily realities of all practitioners. Furthermore, as a qualitative historical review, interpretations are subject to the researcher's perspective and the analytical lens applied.

6. CONCLUSION

Tashrīḥ-ul-Badan served as the foundational bedrock of the Unani system of medicine. Far from presenting a static theoretical subject, canonical texts painstakingly map out anatomical knowledge as a critical engine designed to power diagnostic reasoning, guide physical therapies, and ensure the safety of surgical procedures. The evolution of this knowledge—from Greek foundations to empirical refinement by Arabic physicians—highlights the profound scientific rigor and clinical sophistication envisioned by the Greco-Arabic medical tradition.

7. DECLARATIONS

Author Contributions:

DR. SANU BABU: conceptualization, methodology, original draft preparation.

DR. ASMA MOHAMMAD TAHIR: targeted data extraction identifying specific surgical passages and operative techniques, formal thematic analysis of surgical texts cross-referencing operative descriptions with regional anatomical requirements, supervision, validation, critical review, and editing. All authors have read and agreed to the published version of the manuscript.

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Highlights

- In the Unani system of medicine, Tashrīḥ-ul-Badan (anatomy) functioned as a highly practical clinical science that drove daily medical and surgical interventions.
- Greco-Arabic physicians transitioned from merely preserving classical Greek anatomical concepts to actively synthesizing, critiquing, and revising them.
- Canonical texts have demonstrated that advanced topographical anatomy is a strict prerequisite for operative safety and diagnostic accuracy.
- Recognizing this sophisticated operational role provides a valuable historical framework for contemporary interdisciplinary dialogue on comparative healthcare systems.

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