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AN INTEGRATIVE REVIEW OF CANCER PATHOPHYSIOLOGY

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ABSTRACT

Ayurveda describes tumor-like pathological conditions under the entities Granthi (localized, encapsulated swellings) and Arbuda (larger, progressively increasing and infiltrative swellings). Although these descriptions predate molecular biology, they present a systemic and functional understanding of abnormal tissue growth. The present narrative review aims to compile classical Ayurvedic explanations of Granthi and Arbuda and to conceptually correlate them with contemporary oncological mechanisms, particularly the hallmarks of cancer. Classical Ayurvedic concepts such as Dosha imbalance (with predominance of Kapha and Meda), Agnimandya, Ama formation, Srotorodha, Dhatu vitiation, and Oja kshaya are analyzed and interpreted in light of modern processes including chronic inflammation, metabolic dysregulation, angiogenesis, immune evasion, invasion, metastasis, and cancer-associated cachexia. Available preclinical and review-based evidence on Ayurvedic botanicals with anticancer potential is also summarized. The review highlights conceptual complementarities between Ayurveda and modern oncology while emphasizing the need for rigorous translational and clinical research for safe and evidence-based integration.

KEYWORDS: Arbuda, Granthi, Ayurveda, cancer pathophysiology, hallmarks of cancer, integrative oncology.

INTRODUCTION

Cancer represents a group of diseases characterized by uncontrolled cell proliferation, tissue invasion, and distant metastasis, resulting from cumulative genetic and epigenetic alterations and their interaction with the tissue microenvironment. Modern oncology conceptualizes these changes through the framework of the "hallmarks of cancer," which describe the functional capabilities acquired by malignant cells during tumor progression.

Ayurveda, the traditional system of medicine of India, describes conditions resembling neoplastic growths under Granthi and Arbuda. These entities are explained not as isolated local diseases but as manifestations of systemic imbalance involving Dosha, Agni, Dhatu, and Srotas. Although Ayurvedic texts do not describe cancer in molecular terms, their emphasis on chronicity, progression, tissue infiltration, recurrence, and resistance to treatment closely parallels the clinical behaviour of malignant tumors.

In recent years, there has been growing academic interest in understanding Ayurvedic disease models using contemporary biomedical language. Such an approach does not imply literal equivalence but rather a conceptual translation that may enrich preventive strategies, supportive care, and integrative oncology research. The present review attempts to compile and critically synthesize Ayurvedic pathophysiological descriptions relevant to cancer and align them with modern mechanistic insights.

MATERIALS AND METHODS

This narrative review is based on a structured literature survey conducted between January and December 2025. Classical Ayurvedic texts including Charaka Samhita, Sushruta Samhita, and their authoritative commentaries were referred to for descriptions of Granthi, Arbuda, and associated pathophysiology. Secondary Ayurvedic review articles and conceptual papers were identified from journals such as JAIMS, IRJAY, and other peer-reviewed Ayurvedic publications.

For modern biomedical correlations, foundational oncology literature and integrative oncology reviews were sourced from PubMed, PubMed Central, Google Scholar, and Research Gate. Emphasis was placed on highly cited works describing the hallmarks of cancer, tumor microenvironment, inflammation-driven carcinogenesis, and immune dysregulation. The review follows a qualitative synthesis approach, focusing on conceptual alignment rather than quantitative analysis.

Ayurvedic Description of Tumor-like Conditions

Granthi

Granthi is described as a localized, nodular swelling, often well-circumscribed and relatively slow-growing. Classical descriptions suggest encapsulation and limited spread, and surgical texts emphasize complete excision along with the capsule to prevent recurrence. These features have led many contemporary scholars to compare Granthi with benign tumors or cystic growths.

Arbuda

Arbuda is characterized as a larger, progressively increasing swelling that may involve deeper tissues, ulcerate, produce discharge, and become difficult to treat. Classical texts describe Arbuda as firm, deeply rooted, and capable of recurrence, indicating an aggressive pathological nature. These characteristics are frequently correlated with malignant neoplasms in modern medicine.

Ayurvedic Pathophysiology of Arbuda

Dosha Involvement

Most classical descriptions indicate a predominance of Kapha in Arbuda, contributing to excessive growth, heaviness, and structural proliferation. Meda and Mamsa Dhatu are commonly involved. In advanced stages, vitiated Vata plays a significant role, accounting for rapid spread, pain, tissue destruction, and systemic wasting.

Agnimandya and Ama

Impairment of Agni at both digestive and tissue levels leads to the formation of Ama, described as incompletely processed metabolic by-products. Ama is considered sticky, obstructive, and toxic, creating a favorable internal environment for disease initiation and progression.

Srotorodha

Srotas represent the channels responsible for transport and transformation within the body. Obstruction of these channels due to Ama and vitiated Dosha results in local stagnation, abnormal tissue nourishment, and pathological growth.

Dhatu Vitiation and Oja Kshaya

Progressive involvement and depletion of Dhatu lead to systemic manifestations such as weakness, anemia, and loss of tissue integrity. Ojas, the essence responsible for vitality and immunity, becomes depleted, reducing the body's resistance to disease progression.

Overview of Modern Cancer Pathophysiology

Modern oncology explains cancer progression through the acquisition of functional capabilities known as the hallmarks of cancer. These include sustained proliferative signaling, evasion of growth suppressors, resistance to cell death, replicative immortality, induction of angiogenesis, activation of invasion and metastasis, immune evasion, metabolic reprogramming, and tumor-promoting inflammation. These processes are influenced by genomic instability and the tumor microenvironment.

Conceptual Correlation Between Ayurvedic and contemporary Perspectives

Agnimandya and Ama formation may be conceptually correlated with chronic inflammation, oxidative stress, and metabolic dysfunction, all of which contribute to carcinogenesis. Srotorodha may be understood as impaired tissue microcirculation and lymphatic drainage, leading to hypoxia and angiogenic signaling. Predominance of Kapha and Meda reflects the role of adipose tissue, stromal support, and growth-promoting cytokines in tumor biology. Dhatu Kshaya and Oja Kshaya parallel cancer-associated cachexia and immune dysfunction observed in advanced malignancy.

These correlations are interpretative and functional rather than literal, yet they demonstrate a meaningful overlap between systemic Ayurvedic reasoning and modern mechanistic models.

DISCUSSION

The present review highlights that Ayurvedic explanations of Arbuda emphasize systemic imbalance, chronicity, and progressive tissue involvement rather than isolated local pathology. This perspective aligns with modern understanding of cancer as a disease of the whole organism, influenced by metabolism, immunity, inflammation, and the microenvironment.

A major strength of the Ayurvedic framework lies in its focus on early metabolic dysfunction (Agnimandya) and toxin accumulation (Ama), which may correspond to preclinical stages of carcinogenesis. However, the primary limitation is the lack of direct molecular definitions for

these constructs. Bridging this gap requires identifying measurable biomarkers that can operationalize Ayurvedic concepts in experimental and clinical research.

Current evidence supporting Ayurvedic interventions in cancer remains largely preclinical or adjunctive. While several botanicals demonstrate anti-inflammatory, pro-apoptotic, and immunomodulatory effects in laboratory studies, robust clinical trials are limited. Therefore, Ayurvedic management of cancer should currently be viewed as supportive and complementary rather than curative, emphasizing quality of life, symptom relief, and mitigation of treatment-related toxicity.

CONCLUSION

Ayurvedic descriptions of Granthi and Arbuda provide a comprehensive, systemic understanding of tumor-like diseases grounded in functional pathology. When interpreted through a modern scientific lens, concepts such as Agnimandya, Ama, Srotorodha, Dhatu vitiation, and Oja kshaya show meaningful conceptual alignment with recognized mechanisms of cancer development and progression. While these correlations enrich integrative oncology discourse, further mechanistic validation and clinical research are essential to ensure safe and evidence-based application.

FUTURE RESEARCH DIRECTIONS

1. Identification of biochemical and inflammatory markers corresponding to Ama and Agnimandya.
2. Preclinical evaluation of standardized Ayurvedic formulations against specific cancer hallmarks.
3. Pharmacokinetic and herb–drug interaction studies in oncology settings.
4. Clinical trials assessing adjunctive Ayurvedic interventions for quality of life and treatment tolerance.

REFERENCES

1. Hanahan D, Weinberg RA. Hallmarks of Cancer: The Next Generation. Cell, 2011; 144(5): 646–674.
2. Arnold JT, et al. Integrating ayurvedic medicine into cancer research: challenges and opportunities. BMC/PMC review (2022).
3. Review: Arbuda and its Ayurvedic Management — PDF review summarizing classical descriptions and comparisons with modern cancer, (Semanticscholar).

4. JBPR Review (2020): Arbuda (cancer) — classical descriptions and modern correlations.
5. Frontiers (2025)— Bridging ayurvedic medicine and modern cancer therapeutics: potentials and translational pathways.
6. EPub/PMC: Understanding cancer etiology, A review of the evidence — includes discussions on Ayurvedic approaches to etiology.
7. News/report (2025): Ayurvedic formulation demonstrates anti-cancer and anti-HPV activity (Panchavalkala) — Journal of Ethnopharmacology summary in Times of India.
8. Various comparative reviews: Ayurvedic and Modern Concept of Granthi and Arbuda (IRJAY 2022; ResearchGate resources) used for classical-modern mapping.