Classical Ayurveda Pathophysiology of Grahanidosha and its Correlation with Irritable Bowel Syndrome (IBS).

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Abstract*—Grahanidoshais a well-described gastrointestinal disorder in Ayurvedic literature that arises primarily from impairment of Agni (digestive fire). In classical Ayurvedic physiology, Grahani is considered the organ responsible for retaining ingested food until proper digestion occurs and releasing it into the lower gastrointestinal tract following complete metabolic transformation. When Agni becomes weakened, particularly in the form of Mandagni, digestion becomes defective, leading to the formation of Ama, a pathological metabolic by-product that disrupts digestive physiology and contributes to the development of Grahani Roga. Classical texts describe Grahanidoshaas a chronic digestive disorder characterized by irregular bowel habits, indigestion, abdominal discomfort, heaviness of the body, fatigue, and passage of improperly digested food particles. Contemporary gastroenterology describes several functional gastrointestinal disorders with similar clinical manifestations, among which Irritable Bowel Syndrome (IBS) shows the closest resemblance. IBS is characterized by recurrent abdominal discomfort associated with altered bowel habits, including diarrhea, constipation, or alternating bowel patterns, and affects approximately 10–15% of the global population. The present conceptual review aims to critically analyze the Ayurvedic understanding of Grahanidoshawith reference to classical descriptions of Agni, Nidana, Purvarupa, Rupa, Samprapti, and Chikitsa Siddhanta, and to correlate these concepts with contemporary knowledge of IBS pathophysiology. Classical Ayurvedic texts including Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, and Madhava Nidana were examined along with modern biomedical literature addressing functional gastrointestinal disorders. The analysis highlights conceptual parallels between Ayurvedic descriptions of Mandagni, Ama formation, Dosha imbalance, and Srotodushti and modern mechanisms including altered intestinal motility, gut microbiota dysbiosis, visceral hypersensitivity, and gut–brain axis dysregulation. Understanding Grahanidoshathrough both classical Ayurvedic principles and contemporary biomedical perspectives may provide valuable insights for developing integrative approaches to the management of chronic gastrointestinal disorders.

***Index Terms*—Agni, Ayurveda, Grahani Roga, Irritable Bowel Syndrome, Malabsorption Syndromes.**

I. INTRODUCTION

Proper digestion and metabolism of food are considered the fundamental basis of health in Ayurveda. Classical Ayurvedic texts consistently emphasize that the maintenance of physiological balance and tissue nourishment depends upon the proper functioning of digestive fire, known as Agni. Agni governs the processes of digestion, absorption, assimilation, and metabolic transformation of food into nutritive substances that sustain the body tissues. When Agni functions normally, the ingested food is appropriately digested and converted into Ahara Rasa, which subsequently nourishes the Dhatus and maintains physiological equilibrium. Conversely, impairment of Agni leads to defective digestion and formation of pathological metabolic by-products,

ultimately resulting in disease manifestation. The classical Ayurvedic principle states that the majority of diseases arise from Mandagni, highlighting the central importance of digestive metabolism in the maintenance of health[1].

Among the gastrointestinal disorders described in Ayurvedic literature, Grahanidoshaoccupies a prominent position because of its close association with disturbances in digestive and absorptive processes. In classical Ayurvedic physiology, Grahani is described as the organ responsible for retaining ingested food until the process of digestion is completed and releasing it after proper metabolic transformation has occurred. Acharya Charaka describes Grahani as the seat of digestive fire where food remains until it is adequately digested and processed[2]. The functional integrity of Grahani therefore depends directly upon the strength and stability of Agni. When digestive fire becomes impaired due to improper diet, faulty lifestyle practices, or psychological disturbances, the regulatory function of Grahani becomes disturbed, resulting in defective digestion and irregular movement of food within the gastrointestinal tract.

Acharya Sushruta further explains that Grahani serves as the anatomical and functional site of digestive fire and is responsible for holding ingested food until digestion is completed[3]. This description indicates that the coordinated functioning of Agni and Grahani is essential for maintaining digestive homeostasis. When Agni remains strong and balanced, Grahani retains food for sufficient time to allow proper digestion and assimilation. However, when Agni becomes weakened, the functional capacity of Grahani deteriorates, leading to premature passage of incompletely digested food into the lower gastrointestinal tract. This disturbance ultimately results in the development of Grahani Roga, a disorder characterized by chronic digestive dysfunction.

Classical Ayurvedic texts describe Grahanidoshaas a condition arising primarily from Agnimandya, or impairment of digestive fire. Ashtanga Hridaya explains that disturbances in digestive metabolism affect multiple levels of physiological transformation within the body, ultimately resulting in defective digestion and systemic imbalance[4]. When digestive processes become inefficient, ingested food undergoes incomplete transformation and produces Ama, a toxic metabolic by-product that disrupts physiological functions and contributes to disease pathogenesis. The accumulation of Ama within the gastrointestinal tract interferes with normal digestive and absorptive mechanisms, leading to symptoms such as indigestion, heaviness of the body, fatigue, abdominal discomfort, and irregular bowel habits.

The clinical features described in Grahanidoshabear remarkable similarity to functional gastrointestinal disorders recognized in contemporary medicine. Among these disorders, Irritable Bowel Syndrome (IBS) is most frequently correlated with Grahanidoshabecause of the striking resemblance in symptomatology and chronic functional nature of both conditions. IBS is defined as a functional gastrointestinal disorder characterized by recurrent abdominal discomfort associated with altered bowel habits in the absence of identifiable structural abnormalities[5]. Epidemiological studies indicate that IBS affects approximately 10–15% of the global population, making it one of the most common gastrointestinal disorders encountered in clinical practice[6].

The pathophysiology of IBS is considered multifactorial and involves complex interactions between altered intestinal motility, visceral hypersensitivity, gut microbiota imbalance, and dysregulation of the gut–brain axis[7]. Contemporary research has demonstrated that psychological stress, emotional disturbances, and dietary habits play significant roles in the development and progression of IBS. Interestingly, these factors closely resemble the etiological influences described in Ayurvedic literature for the development of Grahani Roga, which include improper dietary practices, irregular lifestyle habits, and psychological disturbances.

From an Ayurvedic perspective, the pathogenesis of Grahani involves a complex interplay between Agnimandya, Ama formation, Dosha imbalance, and dysfunction of gastrointestinal channels known as Annavaha and Purishavaha Srotas. These disturbances ultimately lead to defective digestion, impaired nutrient absorption, and irregular bowel movements. The classical Ayurvedic model therefore provides a comprehensive explanation of digestive disorders that integrates metabolic, physiological, and psychological factors into a unified conceptual framework.

Understanding Grahanidoshathrough both classical Ayurvedic principles and contemporary biomedical perspectives may provide valuable insights for the

development of integrative approaches in the management of chronic gastrointestinal disorders. The present conceptual review therefore aims to analyze the Ayurvedic understanding of Grahanidoshawith reference to classical descriptions of Agni, Nidana, Purvarupa, Rupa, Samprapti, and Chikitsa Siddhanta, and to correlate these traditional concepts with modern knowledge of Irritable Bowel Syndrome.

II. AGNI–GRAHANI PHYSIOLOGY

The concept of Agni occupies a central position in Ayurvedic physiology and is regarded as the fundamental principle responsible for digestion, metabolism, and transformation within the body. Classical Ayurvedic texts consistently emphasize that the maintenance of health depends upon the proper functioning of Agni, which governs the processes of digestion, absorption, assimilation, and conversion of ingested food into nutritive substances required for tissue nourishment. Acharya Charaka explains that the stability of Agni determines the state of health, whereas impairment of digestive fire results in the manifestation of disease. The classical statement that most diseases arise from Mandagni reflects the fundamental role of digestive metabolism in maintaining physiological equilibrium[1].

Ayurvedic scholars describe multiple forms of Agni responsible for different stages of metabolic transformation within the body. Among these, Jatharagni is considered the principal digestive fire responsible for the primary digestion of food within the gastrointestinal tract. Ashtanga Hridaya explains that metabolic processes occur through the coordinated functioning of Jatharagni, Bhutagni, and Dhatvagni, which regulate successive stages of metabolic transformation from ingested food to tissue-level assimilation[2]. Jatharagni performs the initial stage of digestion by transforming ingested food into absorbable nutritive substances. The proper functioning of Jatharagni is therefore essential not only for digestion but also for maintaining systemic metabolic balance.

Within the framework of Ayurvedic physiology, the organ responsible for supporting and regulating the activity of Jatharagni is Grahani. Acharya Charaka describes Grahani as the structure located below the navel that retains ingested food until the process of digestion is completed and subsequently releases the processed food into the lower gastrointestinal tract[3]. This description indicates that Grahani performs a regulatory role in digestion by ensuring that food remains within the digestive system for an adequate duration to allow proper metabolic transformation.

Acharya Sushruta further elaborates that Grahani represents the anatomical seat of digestive fire and functions by holding the ingested food until digestion is accomplished[4]. The coordinated relationship between Agni and Grahani therefore represents a fundamental component of digestive physiology in Ayurveda. Agni performs the metabolic transformation of food, while Grahani ensures the proper retention of food until digestion is completed. When these two factors function harmoniously, digestion proceeds efficiently and the resulting nutritive substances support the nourishment of body tissues.

The physiological integrity of Grahani is therefore entirely dependent upon the strength and stability of digestive fire. When Agni remains balanced and active, Grahani performs its regulatory function effectively by retaining food during digestion and releasing it only after complete transformation has occurred. However, when Agni becomes weakened or disturbed, the functional capacity of Grahani becomes compromised. Under such conditions, food is not digested properly and may pass prematurely into the lower gastrointestinal tract before metabolic transformation has been completed.

This disturbance in the coordination between Agni and Grahani forms the physiological basis for several digestive disorders described in Ayurvedic literature. When digestive fire becomes impaired, the transformation of food into nutritive substances becomes incomplete and produces pathological metabolic by-products known as Ama. The accumulation of Ama interferes with digestive processes and contributes to disturbances in gastrointestinal physiology. As the impairment of Agni persists, the regulatory function of Grahani progressively deteriorates, leading to defective digestion, malabsorption, and irregular bowel movements that ultimately manifest as Grahani Roga.

Thus, the classical Ayurvedic understanding of digestion emphasizes a dynamic relationship between metabolic transformation and gastrointestinal regulation. Agni governs the biochemical transformation of food, while Grahani regulates the

retention and movement of ingested material within the digestive tract. The harmonious functioning of these two components maintains digestive equilibrium, whereas disturbances in Agni inevitably lead to dysfunction of Grahani and subsequent development of digestive disorders.

III. ETIOPATHOGENESIS OF GRAHANI ROGA

In Ayurvedic pathology, the development of disease is fundamentally associated with exposure to causative factors known as Nidana. The identification and avoidance of these causative factors form the foundation of both disease prevention and therapeutic management. Classical Ayurvedic texts emphasize that disturbances in digestive metabolism arise primarily from improper dietary habits, faulty lifestyle practices, and psychological influences that impair the functional integrity of Agni. When such etiological factors persist over time, digestive fire becomes weakened and initiates the pathological cascade responsible for the development of Grahani Roga[5].

Among the various causative factors described in classical literature, improper dietary practices occupy the most prominent role in the development of digestive disorders. Acharya Charaka explains that repeated consumption of food before the previously ingested meal has been properly digested disturbs digestive fire and contributes to the development of Grahani[6]. This condition, known as Adhyashana, results in metabolic overload of the digestive system and prevents proper transformation of food. As digestion becomes incomplete, partially processed food accumulates within the gastrointestinal tract and undergoes abnormal fermentation.

In addition to Adhyashana, several other dietary patterns are described as important etiological factors in Grahani Roga. Vishamashana, which refers to irregular eating habits such as eating at improper times or consuming food in inconsistent quantities, disrupts digestive metabolism and weakens Agni. Similarly, the consumption of incompatible food combinations known as Viruddha Ahara interferes with normal digestive physiology and promotes the formation of pathological metabolic products. Heavy, oily, excessively dry, or improperly prepared foods are also described as capable of impairing digestive fire when consumed in excess. These dietary disturbances gradually weaken the digestive system and create conditions favorable for the development of Mandagni.

Lifestyle-related factors also contribute significantly to the pathogenesis of Grahani Roga. Classical Ayurvedic texts describe that suppression of natural urges, irregular sleep patterns, excessive physical exertion, and improper daily routines disturb the balance of Doshas and impair digestive metabolism. Such disturbances alter the physiological regulation of digestion and interfere with the coordinated functioning of Agni and Grahani.

Psychological influences are also recognized as important contributors to digestive disorders in Ayurveda. Emotional disturbances such as fear, anger, grief, anxiety, and excessive mental stress are described as factors capable of impairing digestive fire. These observations demonstrate that classical Ayurvedic scholars recognized the close relationship between psychological states and gastrointestinal physiology. Disturbances of mental equilibrium may therefore weaken digestive metabolism and contribute to the development of Grahani Roga.

Another important etiological mechanism described in classical texts involves the development of Grahani following improperly managed episodes of Atisara, or diarrhea. Acharya Sushruta explains that during the recovery phase of Atisara, digestive fire remains weak and unstable. If heavy or incompatible food is consumed during this stage before digestive capacity has been fully restored, the weakened Agni fails to process the ingested food properly. This leads to persistent digestive impairment and ultimately results in the development of Grahani Roga[7].

The cumulative effect of these dietary, lifestyle, and psychological factors leads to progressive impairment of digestive fire. When Agni becomes weakened, the digestion of food becomes incomplete and produces pathological metabolic residues known as Ama. Ama possesses properties such as heaviness, stickiness, and obstructive characteristics that interfere with normal physiological processes. As Ama accumulates within the gastrointestinal tract, it disrupts digestive physiology and contributes to the development of Dosha imbalance.

Thus, the etiopathogenesis of Grahanidoshabegins with exposure to Nidana that impair digestive fire, leading to Mandagni and incomplete digestion of food. The resulting formation and accumulation of Ama subsequently disturb physiological regulation and

contribute to the progressive development of digestive dysfunction. This process ultimately culminates in the clinical manifestations of Grahanidoshacharacterized by defective digestion, malabsorption, and irregular bowel habits.

IV. CLINICAL SPECTRUM AND DIAGNOSTIC FRAMEWORK

The clinical manifestations of Grahanidoshadescribed in Ayurvedic literature evolve gradually as digestive impairment progresses from subtle functional disturbances to clearly identifiable gastrointestinal symptoms. Classical Ayurvedic texts describe that diseases typically develop through recognizable stages beginning with early warning manifestations followed by fully developed clinical features. Recognition of these manifestations is important because early disturbances in digestive metabolism often precede the establishment of chronic gastrointestinal disease. Grahanidoshafollows this classical pattern in which impairment of digestive fire initially produces functional disturbances that gradually develop into characteristic digestive symptoms[8].

Acharya Charaka describes that early manifestations associated with the development of Grahani arise primarily from disturbances in digestive metabolism and incomplete digestion of food. When digestive fire becomes weakened, digestion becomes delayed and inefficient, resulting in accumulation of partially digested food within the gastrointestinal tract. This metabolic disturbance produces early symptoms that reflect impaired digestive physiology. Classical descriptions include excessive thirst, lethargy, fatigue, loss of strength, heaviness of the body, burning sensation after food intake, and delayed digestion. These symptoms reflect the progressive weakening of digestive metabolism and the accumulation of pathological metabolic products within the digestive system[9].

Among these early manifestations, delayed digestion of food is considered a particularly significant clinical indicator because it directly reflects impairment of digestive fire. Similarly, heaviness of the body and persistent fatigue are described as consequences of metabolic sluggishness associated with the accumulation of incompletely processed food substances within the digestive tract. These early symptoms indicate that digestive physiology has become disturbed and that further progression of disease may occur if corrective measures are not implemented.

If the causative factors persist and digestive impairment continues, the condition progresses to the stage of fully manifested disease in which the classical clinical features of Grahanidoshabecome evident. Acharya Charaka describes the characteristic symptoms of Grahani as irregular bowel movements accompanied by indigestion, heaviness of the body, excessive moisture or mucus in stool, and persistent thirst[10]. One of the hallmark features emphasized in classical descriptions is the passage of stool that alternates between formed and loose consistency, reflecting defective digestion and irregular movement of food within the gastrointestinal tract.

In addition to irregular bowel habits, several associated digestive symptoms are described in classical texts. These include loss of appetite, altered taste perception, excessive salivation, belching, abdominal discomfort, and passage of stool containing improperly digested food particles. Such manifestations indicate impairment of both digestive and absorptive processes within the gastrointestinal system. Chronic digestive dysfunction may also produce systemic symptoms such as fatigue, weakness, and reduced physical endurance due to inadequate tissue nourishment.

Madhava Nidana provides a detailed description of Grahanidoshaand emphasizes that defective digestive metabolism represents the central pathological factor underlying the disease[11]. The text describes that impaired digestion results in the production of improperly processed food material that remains within the gastrointestinal tract and interferes with normal digestive physiology. As digestive disturbance persists, bowel habits become irregular and stool may contain undigested food particles, mucus, or abnormal moisture. These clinical features indicate that the digestive system is unable to properly process ingested food and maintain normal gastrointestinal function.

The classical descriptions of Grahanidoshademonstrate a sophisticated understanding of gastrointestinal dysfunction that closely resembles several functional digestive disorders recognized in modern medicine. The irregular stool consistency described in Ayurvedic texts reflects disturbances in both digestive transformation and intestinal motility. These

observations correspond closely with modern descriptions of functional gastrointestinal disorders in which altered bowel habits occur due to disturbances in intestinal motility and regulatory mechanisms of digestion.

Thus, the clinical spectrum of Grahanidoshareflects progressive impairment of digestive physiology beginning with early disturbances in digestive metabolism and culminating in characteristic manifestations of chronic gastrointestinal dysfunction. The classical Ayurvedic descriptions of Purvarupa and Rupa therefore provide valuable diagnostic insights that help identify digestive disturbances at early stages and facilitate timely therapeutic intervention.

V. SAMPRAPTI (PATHOGENIC MECHANISMS)

In Ayurvedic pathology, the concept of Samprapti refers to the sequential process through which disease develops within the body. Understanding Samprapti is essential for interpreting the mechanisms underlying disease manifestation and for designing appropriate therapeutic strategies. In the context of Grahani Roga, classical Ayurvedic texts describe a distinct pathogenic sequence in which impairment of digestive fire initiates a cascade of metabolic and physiological disturbances that ultimately culminate in chronic digestive dysfunction. The central pathological factor in this process is Agnimandya, or weakening of digestive fire, which disrupts the normal transformation of food within the gastrointestinal system[12].

Acharya Charaka explains that when digestive fire becomes impaired, the ingested food cannot be properly digested or metabolically transformed. As a result, partially digested food material accumulates within the gastrointestinal tract and undergoes abnormal fermentation. This defective metabolic process produces pathological residues known as Ama, which represent toxic metabolic by-products of incomplete digestion. The formation of Ama therefore constitutes a critical step in the pathogenesis of Grahanidoshabecause it disrupts digestive physiology and initiates further pathological changes within the body[13].

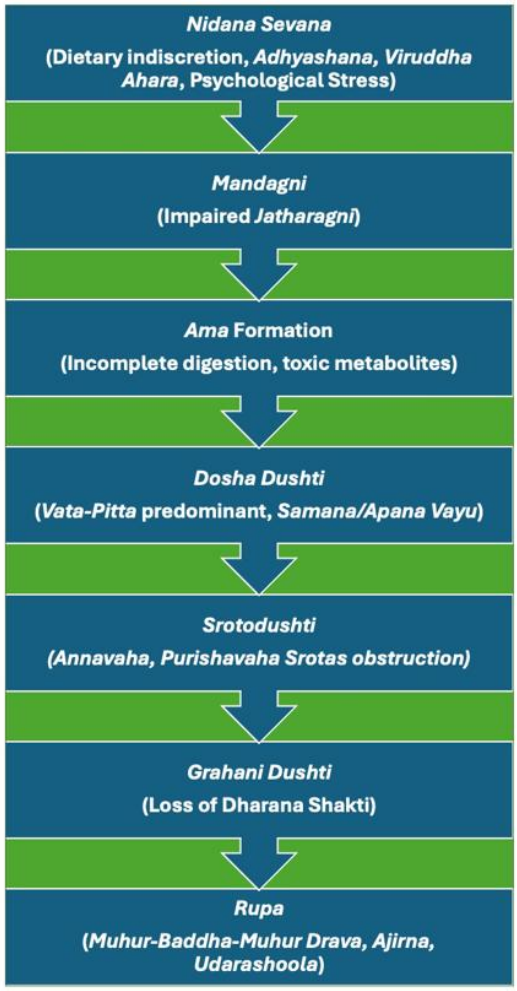

Figure 1: Classical Samprapti of Grahanidoshashowing sequential progression

Ama possesses several properties that interfere with normal physiological processes. Classical Ayurvedic texts describe Ama as heavy, sticky, and obstructive in nature. These characteristics enable Ama to accumulate within physiological channels known as Srotas and interfere with the movement of nutrients and waste products. As Ama accumulates within the digestive system, it obstructs normal digestive processes and contributes to further weakening of digestive fire. This interaction between Ama accumulation and impaired digestive metabolism creates a self-perpetuating pathological cycle that progressively disrupts gastrointestinal function.

The development of Grahanidoshaalso involves significant disturbance of Doshas, particularly Vata Dosha. Among the subdivisions of Vata, Samana Vayu plays a major regulatory role in digestion by

controlling the movement and transformation of food within the gastrointestinal tract. When digestive fire becomes impaired and Ama accumulates within the digestive system, the normal function of Samana Vayu becomes disturbed. This disturbance disrupts the coordinated regulation of digestion and contributes to defective metabolic transformation of food.

Apana Vayu, which governs the elimination of waste products from the body, is also affected during the progression of Grahani Roga. Disturbances in Apana Vayu result in irregular bowel movements and abnormal stool formation, which represent characteristic clinical features of the disease. In addition to Vata disturbances, Pachaka Pitta, the digestive component of Pitta Dosha responsible for metabolic transformation, becomes impaired due to weakened digestive fire. Kledaka Kapha, which normally lubricates the gastrointestinal tract and facilitates digestion, may also become vitiated and contribute to excessive mucus formation within the digestive system.

The pathological interaction between Ama and vitiated Doshas leads to dysfunction of several physiological channels, particularly Annavaha Srotas, Purishavaha Srotas, and Rasavaha Srotas. Annavaha Srotas are responsible for the transport and processing of ingested food, while Purishavaha Srotas regulate the elimination of fecal matter. Rasavaha Srotas are involved in the distribution of nutritive substances derived from digested food. When these channels become obstructed or functionally disturbed due to Ama accumulation and Dosha imbalance, the normal processes of digestion, absorption, and nutrient transport become impaired.

Within the framework of classical Ayurvedic pathology, the Udbhavasthana, or site of origin of Grahani Roga, is primarily located within the region of the gastrointestinal tract where digestive transformation occurs. The Adhisthana, or principal site of disease manifestation, is Grahani itself, which represents the functional seat of digestive fire. When digestive fire becomes weakened, Grahani loses its capacity to retain food until digestion is completed. Consequently, incompletely digested food is prematurely released into the lower gastrointestinal tract, resulting in defective digestion and irregular stool formation.

This sequence of pathological events can therefore be understood as a progressive chain beginning with exposure to etiological factors, followed by impairment of digestive fire, formation of Ama, Dosha imbalance, obstruction of physiological channels, and eventual dysfunction of Grahani. As this pathological process continues, the digestive system becomes unable to maintain normal digestive and absorptive functions, ultimately leading to the characteristic clinical manifestations of Grahani Roga.

The classical Ayurvedic Samprapti of Grahanidoshamay therefore be summarized as a sequence in which Nidana leads to Agnimandya, which subsequently produces Ama. The accumulated Ama interacts with vitiated Doshas and disturbs the normal functioning of digestive channels. As these disturbances progress, the regulatory function of Grahani becomes impaired, resulting in defective digestion and chronic gastrointestinal dysfunction.

VI. MODERN CORRELATION WITH IRRITABLE BOWEL SYNDROME

Functional gastrointestinal disorders represent a group of conditions characterized by chronic digestive symptoms without identifiable structural abnormalities. Among these disorders, Irritable Bowel Syndrome (IBS) is considered one of the most prevalent gastrointestinal conditions encountered in clinical practice. IBS is defined as a functional bowel disorder characterized by recurrent abdominal discomfort associated with altered bowel habits in the absence of detectable structural or biochemical pathology[14]. The Rome IV diagnostic criteria describe IBS as a condition in which abdominal pain occurs at least once weekly and is associated with changes in stool frequency, stool form, or both[15].

Epidemiological studies indicate that IBS affects approximately 10–15% of the global population and represents a significant cause of morbidity, healthcare utilization, and reduced quality of life[16]. The disorder frequently manifests during early adulthood and tends to follow a chronic relapsing course characterized by episodic exacerbations and remissions. Despite extensive research, the exact pathophysiology of IBS remains incompletely understood. Contemporary biomedical research suggests that IBS develops through complex interactions involving altered intestinal motility, visceral hypersensitivity, disturbances in gut microbiota composition, immune activation, and dysregulation of the gut–brain axis[17].

The concept of visceral hypersensitivity is considered one of the central mechanisms underlying IBS. Patients with IBS frequently demonstrate exaggerated sensory responses to normal physiological stimuli within the gastrointestinal tract. Experimental studies have shown that individuals with IBS exhibit heightened perception of intestinal distension and altered neural processing of visceral signals[18]. These disturbances are believed to arise from abnormalities in the bidirectional communication between the gastrointestinal tract and the central nervous system, commonly referred to as the gut–brain axis.

Table 1: Conceptual mapping between Ayurvedic Grahanidoshapathogenesis and modern IBS pathophysiology

Ayurvedic Concept	Modern IBS Mechanism
Mandagni (impaired digestive fire)	Reduced digestive efficiency, altered enzymatic activity, and disturbed microbial metabolism
Ama formation (toxic metabolic by-products of incomplete digestion)	Gut microbiome dysbiosis, abnormal fermentation, and accumulation of microbial metabolites
Samana Vayu Dushti (disturbance of regulatory digestive Vata)	Abnormal intestinal motility and enteric nervous system dysregulation
Srotorodha (obstruction or dysfunction of physiological channels)	Visceral hypersensitivity and altered intestinal permeability
Manasika Nidana (psychological etiological factors such as stress, anxiety, grief)	Dysregulation of the gut–brain axis affecting motility, secretion, and visceral perception

The gut–brain axis represents an intricate network involving neural, endocrine, and immune pathways that regulate gastrointestinal physiology. Psychological stress and emotional disturbances have been shown to influence intestinal motility, secretion, mucosal immune responses, and visceral sensitivity through this regulatory system[19]. These observations correspond closely with classical Ayurvedic descriptions that identify emotional disturbances such as anxiety, grief, anger, and fear as factors capable of impairing digestive metabolism and contributing to gastrointestinal disorders.

Another important mechanism implicated in the pathophysiology of IBS is intestinal dysbiosis, which refers to alterations in the composition and metabolic activity of gut microbiota. Emerging research has demonstrated that disruptions in the normal microbial ecosystem of the intestine may influence digestive processes, intestinal permeability, immune responses, and neural signaling within the gastrointestinal tract[20]. Such disturbances can contribute to symptoms including abdominal discomfort, bloating, altered bowel habits, and impaired digestion.

When examined from an Ayurvedic perspective, several of these mechanisms demonstrate conceptual parallels with the classical pathogenesis of Grahani Roga. The impairment of digestive fire described in Ayurveda corresponds conceptually to disturbances in digestive metabolism and enzymatic activity observed in functional gastrointestinal disorders. Similarly, the formation of Ama as a consequence of incomplete digestion may be interpreted as a conceptual representation of pathological metabolic residues, microbial metabolites, or inflammatory mediators that accumulate when digestive processes become disturbed.

The disturbance of Samana Vayu described in Ayurvedic texts, which regulates the movement and transformation of food within the gastrointestinal tract, may also be conceptually correlated with abnormalities in intestinal motility and enteric nervous system regulation observed in IBS. Likewise, the obstruction or dysfunction of physiological channels known as Srotas may reflect disturbances in intestinal transport mechanisms, mucosal barrier function, and nutrient absorption processes described in modern gastroenterology.

Although Grahanidoshacannot be equated directly with a single modern disease entity, the closest clinical correlation is Irritable Bowel Syndrome, particularly the mixed subtype characterized by alternating patterns of constipation and diarrhea. Both conditions represent chronic functional disorders of digestion in which symptoms arise primarily from disturbances in physiological regulation rather than structural abnormalities of the gastrointestinal tract.

Therefore, the classical Ayurvedic description of Grahanidoshaprovides a conceptual framework that parallels many aspects of contemporary understanding of functional gastrointestinal disorders. Integrating these perspectives may provide valuable opportunities for developing comprehensive approaches to the management of chronic digestive diseases that incorporate both traditional Ayurvedic principles and modern biomedical insights.

VII. THERAPEUTIC PRINCIPLES AND MANAGEMENT STRATEGY

The management of Grahanidoshain Ayurveda is primarily directed toward restoring the functional integrity of digestive fire and correcting the metabolic disturbances that arise from impaired digestion. Classical Ayurvedic texts emphasize that the fundamental therapeutic objective in Grahani is the restoration of Agni because the strength of digestive fire determines the proper digestion, absorption, and assimilation of nutrients. When digestive fire becomes weakened, metabolic transformation of food becomes defective, leading to the accumulation of pathological residues within the gastrointestinal system. Consequently, therapeutic interventions in Grahanidoshaare designed to eliminate etiological factors, stimulate digestive metabolism, remove accumulated Ama, and restore normal gastrointestinal function[21].

The first and most essential principle of management described in Ayurvedic literature is Nidana Parivarjana, which refers to the elimination of causative factors responsible for the development of disease. Improper dietary practices such as irregular meal timing, overeating, incompatible food combinations, and consumption of food before the previous meal has been properly digested must be corrected in order to restore digestive balance. Similarly, lifestyle disturbances including irregular sleep patterns, suppression of natural urges, and psychological stress should be addressed because these factors contribute to impairment of digestive metabolism. By removing the underlying etiological factors, further aggravation of digestive dysfunction can be prevented and the restoration of Agni becomes possible[22].

Once the etiological factors have been addressed, the therapeutic approach focuses on strengthening digestive fire through the use of Deepana and Pachana therapies. Deepana refers to measures that stimulate digestive capacity and enhance the functional activity of Agni, whereas Pachana refers to therapies that promote the digestion and elimination of accumulated Ama. These two therapeutic principles are considered fundamental in the management of Grahani because they directly target the metabolic disturbances responsible for disease progression. Herbal formulations possessing digestive and carminative properties are commonly employed to stimulate digestive metabolism and improve gastrointestinal function.

In cases where Ama accumulation is prominent, classical texts recommend Langhana therapy, which involves the use of light dietary regimens and fasting strategies that reduce the metabolic burden on the digestive system. By limiting the intake of heavy or difficult-to-digest foods, Langhana allows digestive fire to recover and facilitates the gradual digestion of accumulated Ama. Once digestive capacity begins to improve, gradually nourishing dietary measures can be introduced to restore digestive strength.

Dietary regulation plays a particularly important role in the management of Grahani Roga. Classical Ayurvedic texts recommend the use of light, easily digestible foods that support digestive metabolism while minimizing metabolic strain on the gastrointestinal system. Preparations such as Peya and Vilepi are often recommended during the early stages of treatment because they provide nourishment while remaining easy to digest. As digestive capacity improves, patients may gradually transition to more substantial foods through the process of Samsarjana Krama, which represents a carefully structured dietary progression designed to restore digestive strength without overwhelming the recovering digestive system[23].

Another important therapeutic principle described in the management of Grahanidoshainvolves the use of Grahi therapies, which improve intestinal absorption and help stabilize bowel movements. These therapies are particularly beneficial in patients experiencing frequent loose stools or irregular bowel habits. Classical Ayurvedic texts frequently recommend the use of Takra-based preparations in the management of Grahani because Takra possesses digestive, absorbent, and probiotic properties that help restore normal gastrointestinal function. The use of Takra preparations is described extensively in Ayurvedic literature as a valuable dietary intervention for digestive disorders associated with impaired metabolism.

In chronic or severe cases of Grahani Roga, Panchakarma therapies may also be employed to eliminate accumulated Doshas and restore physiological balance. Among the Panchakarma procedures, Basti therapy is considered particularly beneficial because disturbances of Vata Dosha play a

major role in the pathogenesis of Grahani. Basti therapy helps regulate intestinal motility, improve digestive function, and correct the underlying Dosha imbalance contributing to digestive disturbance. When administered appropriately according to classical guidelines, Basti therapy can significantly improve gastrointestinal function in patients suffering from chronic digestive disorders[24].

In addition to dietary and pharmacological interventions, Ayurvedic texts emphasize the importance of psychological management in the treatment of digestive disorders. Emotional disturbances such as stress, anxiety, and excessive mental strain are recognized as factors capable of impairing digestive metabolism. Therefore, therapeutic approaches that promote mental stability and emotional balance may contribute to improved digestive function and overall well-being.

Thus, the therapeutic management of Grahanidoshareflects a comprehensive approach that integrates dietary regulation, metabolic correction, Dosha balancing, and lifestyle modification. By restoring digestive fire, eliminating accumulated Ama, and correcting physiological imbalances within the gastrointestinal system, Ayurvedic treatment strategies aim to address both the symptoms and underlying causes of digestive disorders.

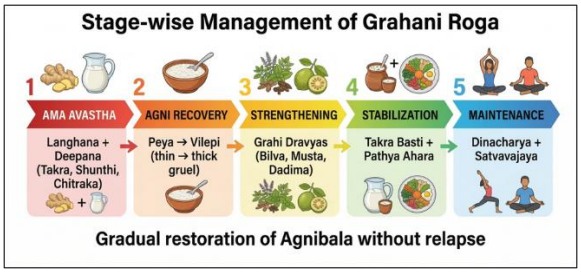

Figure 2: Ayurveda therapeutic framework for Grahani Roga

VIII. INTEGRATIVE CLINICAL IMPLICATIONS

The conceptual framework of Grahanidoshadescribed in classical Ayurvedic literature provides a comprehensive model for understanding chronic digestive disorders that integrates metabolic, physiological, and psychological dimensions of gastrointestinal function. Unlike reductionist biomedical models that frequently focus on isolated pathological mechanisms, the Ayurvedic interpretation of Grahani emphasizes the interrelationship between digestive metabolism, dietary behavior, emotional health, and systemic physiological balance. This integrative perspective is particularly relevant in the context of functional gastrointestinal disorders such as Irritable Bowel Syndrome, which are increasingly recognized as complex conditions involving multiple interacting physiological systems[25].

The classical concept of Agni as the central determinant of digestive health offers a valuable interpretative framework for understanding disturbances in gastrointestinal metabolism. In modern biomedical terms, digestive metabolism involves coordinated enzymatic activity, intestinal motility, microbial metabolism, and neuroendocrine regulation. When these processes become disturbed, digestive efficiency declines and symptoms such as abdominal discomfort, altered bowel habits, and impaired nutrient absorption may develop. These observations parallel the Ayurvedic concept of Agnimandya, in which weakened digestive metabolism leads to incomplete transformation of food and subsequent digestive dysfunction.

Similarly, the Ayurvedic concept of Ama may provide a conceptual framework for understanding the accumulation of pathological metabolic by-products associated with impaired digestion. Contemporary research suggests that disturbances in intestinal microbiota, increased intestinal permeability, and abnormal metabolic activity within the gastrointestinal tract can lead to the production of inflammatory mediators and toxic metabolites that contribute to gastrointestinal symptoms[26]. These pathological metabolic products may conceptually resemble the classical description of Ama as a harmful substance generated through defective digestion and metabolic transformation.

Another important point of convergence between Ayurvedic and modern perspectives concerns the role of neurological regulation in gastrointestinal function. The Ayurvedic description of Samana Vayu as a regulatory force governing digestive transformation and movement of food within the gastrointestinal tract closely parallels modern descriptions of the enteric nervous system. The enteric nervous system coordinates intestinal motility, secretion, and sensory signaling through complex neural networks that communicate bidirectionally with the central nervous system. Disturbances in this regulatory system are

considered major contributors to the pathophysiology of IBS and other functional gastrointestinal disorders[27].

The recognition of psychological influences on digestive health represents another important area of conceptual overlap between Ayurveda and contemporary medicine. Classical Ayurvedic texts identify emotional disturbances such as anxiety, grief, anger, and fear as factors capable of impairing digestive metabolism and contributing to gastrointestinal disorders. Modern research has confirmed that psychological stress significantly affects gastrointestinal physiology through the gut–brain axis, influencing intestinal motility, mucosal immune responses, visceral sensitivity, and microbial composition[28]. These observations reinforce the relevance of the classical Ayurvedic view that digestive health cannot be separated from emotional and psychological well-being.

From a clinical perspective, the integrative interpretation of Grahanidoshaand IBS may offer valuable opportunities for improving therapeutic strategies for chronic gastrointestinal disorders. Conventional medical management of IBS primarily focuses on symptom control through dietary modification, pharmacological interventions, and psychological therapies. However, long-term management of functional gastrointestinal disorders often remains challenging due to the multifactorial nature of these conditions. The Ayurvedic approach to Grahani Roga, which emphasizes restoration of digestive metabolism, elimination of metabolic toxins, regulation of dietary practices, and correction of lifestyle disturbances, may provide complementary strategies for addressing the underlying physiological disturbances associated with chronic digestive dysfunction.

Dietary regulation, which forms a central component of Ayurvedic therapy, is increasingly recognized as an important therapeutic strategy in modern management of IBS. Clinical studies have demonstrated that dietary patterns significantly influence gastrointestinal symptoms, intestinal motility, and microbial composition. The emphasis placed in Ayurveda on regular meal timing, appropriate food combinations, and consumption of easily digestible foods aligns with contemporary nutritional strategies aimed at reducing gastrointestinal symptom burden.

Furthermore, Ayurvedic therapeutic measures designed to improve digestive metabolism and restore gastrointestinal balance may offer promising complementary approaches in the management of functional digestive disorders. Herbal formulations possessing digestive, anti-inflammatory, and carminative properties have been shown in several studies to improve symptoms of indigestion, abdominal discomfort, and altered bowel habits. Integrative research exploring the pharmacological properties of traditional Ayurvedic formulations may therefore contribute to the development of novel therapeutic approaches for chronic gastrointestinal conditions.

Thus, the integrative interpretation of Grahanidoshaprovides a conceptual bridge between classical Ayurvedic knowledge and contemporary biomedical understanding of digestive disorders. By combining insights from both traditions, clinicians and researchers may develop more comprehensive strategies for diagnosing, managing, and preventing chronic gastrointestinal diseases. The integration of Ayurvedic principles with modern gastroenterological research therefore represents a promising avenue for improving clinical outcomes in patients suffering from functional digestive disorders.

IX. DISCUSSION

The conceptual framework of Grahanidoshadescribed in classical Ayurvedic literature reflects a sophisticated understanding of digestive physiology and gastrointestinal pathology. Unlike modern biomedical models that frequently emphasize structural abnormalities or isolated physiological disturbances, the Ayurvedic approach integrates metabolic function, gastrointestinal motility, dietary behavior, and psychological influences into a unified explanatory system. This holistic perspective is particularly relevant for conditions such as Irritable Bowel Syndrome, which are currently understood as functional disorders arising from complex interactions among neurological, immunological, microbial, and metabolic processes[29].

The central role of Agni in Ayurvedic physiology represents one of the most important conceptual contributions of classical medicine to the understanding of digestive disorders. In contemporary biomedical terms, digestion involves coordinated

activity of gastric secretion, enzymatic transformation, intestinal motility, mucosal absorption, and microbial metabolism. When these physiological mechanisms become disturbed, digestive efficiency declines and symptoms such as abdominal discomfort, bloating, altered bowel habits, and fatigue may arise. The Ayurvedic concept of Agnimandya, which describes impairment of digestive metabolism, closely parallels these modern observations of digestive dysfunction.

The concept of Ama described in Ayurvedic texts may also offer an interpretative framework for understanding the metabolic disturbances associated with functional gastrointestinal disorders. Ama is described as a toxic metabolic by-product produced when digestion becomes incomplete. Contemporary biomedical research has identified several analogous processes that occur in chronic digestive disorders, including accumulation of inflammatory mediators, microbial metabolites, and metabolic toxins generated by abnormal intestinal fermentation. These substances may alter intestinal motility, disrupt mucosal function, and influence neural signaling within the gastrointestinal tract[30].

Another important aspect of Grahani pathogenesis involves disturbances in the regulatory functions of Vata Dosha, particularly Samana Vayu and Apana Vayu. Samana Vayu governs digestive transformation and movement of food within the gastrointestinal tract, whereas Apana Vayu regulates elimination of waste products. Disturbances in these physiological processes result in irregular bowel movements and defective digestion, which represent hallmark features of Grahani Roga. Modern gastroenterological research similarly identifies disturbances in intestinal motility and enteric nervous system function as central mechanisms underlying IBS. Abnormal neural signaling within the gut can lead to irregular intestinal contractions, altered transit time, and abnormal stool patterns[31].

The role of the gut–brain axis in the development of functional gastrointestinal disorders further supports the relevance of classical Ayurvedic observations regarding psychological influences on digestive health. Contemporary research demonstrates that emotional stress and psychological disturbances influence gastrointestinal physiology through neural, endocrine, and immune pathways connecting the central nervous system and the gastrointestinal tract. These interactions can alter intestinal motility, visceral sensitivity, mucosal immunity, and microbial composition[32]. Classical Ayurvedic texts similarly recognize emotional disturbances such as anxiety, grief, anger, and fear as factors capable of impairing digestive metabolism and contributing to the development of digestive disorders.

Another important parallel between the Ayurvedic and modern interpretations of digestive disease involves the role of intestinal microbiota. Recent advances in microbiome research have revealed that the intestinal microbial ecosystem plays a critical role in regulating digestion, immune responses, and metabolic processes. Dysbiosis, or imbalance of gut microbiota, has been associated with several functional gastrointestinal disorders including IBS[33]. Although classical Ayurvedic texts do not describe microbial physiology explicitly, the concept of Ama formation resulting from impaired digestion may conceptually correspond to abnormal microbial fermentation and production of toxic metabolites within the digestive tract.

The therapeutic approach described in Ayurveda for the management of Grahanidoshafurther reflects a comprehensive understanding of digestive disorders. Rather than focusing exclusively on symptom relief, Ayurvedic treatment emphasizes restoration of digestive metabolism, elimination of pathological metabolic residues, regulation of dietary practices, and correction of lifestyle disturbances. These therapeutic principles correspond closely with modern strategies for managing functional gastrointestinal disorders, which frequently involve dietary modification, stress management, and interventions aimed at improving intestinal function.

However, it is important to acknowledge that direct equivalence between Grahanidoshaand Irritable Bowel Syndrome cannot be established with complete certainty because the conceptual frameworks of Ayurveda and modern medicine differ significantly. Grahanidosharepresents a broader functional disorder of digestion and absorption that may encompass several gastrointestinal conditions described in contemporary medicine. Nevertheless, the clinical similarities between these two conditions provide a valuable opportunity for exploring integrative approaches to gastrointestinal health that combine traditional Ayurvedic principles with modern biomedical insights.

Future research exploring the physiological and pharmacological mechanisms underlying Ayurvedic therapeutic interventions may provide further evidence supporting the clinical relevance of classical digestive concepts. Investigations examining the effects of Ayurvedic dietary practices, herbal formulations, and Panchakarma therapies on gut microbiota, intestinal motility, and metabolic regulation may contribute to a deeper understanding of the potential role of Ayurveda in the management of chronic gastrointestinal disorders.

X. CONCLUSION

Grahanidosharepresents a complex digestive disorder described in classical Ayurvedic literature that arises primarily from impairment of digestive fire and subsequent disturbances in digestive physiology. The classical Ayurvedic model of Grahani emphasizes the central importance of metabolic transformation, gastrointestinal regulation, and systemic physiological balance in maintaining digestive health. According to Ayurvedic understanding, the development of Grahanidoshaoccurs through a sequence of pathological events beginning with exposure to etiological factors that weaken digestive fire. Impaired digestive metabolism results in incomplete transformation of food and the formation of Ama, which subsequently interacts with vitiated Doshas and disturbs the normal functioning of gastrointestinal channels. As this pathological process progresses, the regulatory function of Grahani becomes impaired, leading to defective digestion, irregular bowel movements, and impaired nutrient absorption.

The clinical manifestations of Grahanidoshadescribed in classical texts show notable similarities to functional gastrointestinal disorders recognized in modern medicine, particularly Irritable Bowel Syndrome. Both conditions are characterized by chronic digestive disturbances including abdominal discomfort, irregular bowel habits, impaired digestion, and significant influence of psychological factors on gastrointestinal function. Contemporary biomedical research identifies several mechanisms underlying IBS, including disturbances in intestinal motility, visceral hypersensitivity, dysregulation of the gut–brain axis, immune activation, and alterations in gut microbiota. These mechanisms demonstrate conceptual parallels with Ayurvedic descriptions of Agnimandya, Ama formation, Dosha imbalance, and Srotodushti.

The Ayurvedic approach to the management of Grahanidoshaemphasizes restoration of digestive fire, elimination of pathological metabolic residues, regulation of dietary practices, and correction of lifestyle disturbances that contribute to digestive dysfunction. Therapeutic strategies including Deepana, Pachana, dietary regulation, and Panchakarma therapies aim to restore physiological balance and improve digestive function. When examined in the context of modern gastrointestinal physiology, these therapeutic principles may offer complementary approaches for managing functional digestive disorders that remain challenging to treat using conventional biomedical methods alone.

Understanding Grahanidoshathrough both classical Ayurvedic principles and contemporary biomedical perspectives provides a valuable framework for developing integrative strategies for the management of chronic gastrointestinal disorders. Further interdisciplinary research exploring the physiological mechanisms underlying Ayurvedic therapeutic interventions may contribute to the development of novel integrative approaches for improving digestive health and managing functional gastrointestinal diseases.

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