

Clinical Evaluation of Panchakola Churna with Lifestyle and Dietary Modification in Non-Alcoholic Fatty Liver Disease (Nafld): A Case Study

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ABSTRACT

Introduction: Non-alcoholic fatty liver disease (NAFLD) is one of the most common chronic liver disorders worldwide and is closely associated with obesity, insulin resistance, metabolic syndrome, and sedentary lifestyle. Although NAFLD is not described as a distinct disease entity in Ayurveda, it can be correlated with Santarpanaja Vikara, particularly Medosanchaya in Yakrit (fat accumulation in the liver), resulting from impaired Agni, Medo Dhatu Dushti, and vitiation of Kapha and Pitta Doshas. This case report presents a 52-year-old female who presented with abdominal discomfort, fatigue, and excessive gas formation. Ultrasonography revealed Grade II fatty liver, while laboratory investigations showed dyslipidemia with elevated total cholesterol, triglycerides, and very-low-density lipoprotein (VLDL) levels, along with reduced high-density lipoprotein (HDL) levels. Based on the clinical findings and investigations, the patient was diagnosed with NAFLD. An Ayurvedic treatment protocol consisting of PanchakolaChurna, along with dietary and lifestyle modifications, was administered for two months. At the end of the treatment period, the patient demonstrated marked symptomatic relief, normalization of ultrasonographic findings, and significant improvement in the lipid profile. This case suggests that Panchakola Churna, when combined with appropriate lifestyle and dietary modifications, may play a beneficial role in the management of NAFLD by improving digestion, regulating lipid metabolism, and supporting hepatic function.

Materials and Methods: A 52-year-old Female presented with abdominal discomfort, fatigue, and excessive gas formation. Ultrasonography revealed Grade II fatty liver, while laboratory investigations showed elevated total cholesterol, triglycerides, and VLDL levels with reduced HDL levels. The patient received PanchakolaChurna along with Nidana Parivarjana, Pathya-Apathya, and lifestyle modifications for two months.

Results: After treatment, the patient showed marked improvement in abdominal discomfort, fatigue, and excessive gas formation. Follow-up ultrasonography demonstrated regression of Grade II fatty liver changes. Laboratory investigations showed reductions in total cholesterol, triglycerides, and VLDL levels with improvement in HDL levels. No adverse effects were observed during the treatment period.

Discussion: The observed improvements may be attributed to the Deepana, Pachana, Kapha-Medohara, and Agni-stimulating properties of PanchakolaChurna, along with dietary and lifestyle modifications. This approach may improve digestion, regulate lipid metabolism, and reduce hepatic fat accumulation. This case suggests that Ayurvedic management may be beneficial in early-stage NAFLD; however, larger clinical studies are required to validate these findings.

Keywords: Medodushti, Medosanchaya in Yakrit, Nidana parivarjana, Non-alcoholic fatty liver disease (NAFLD), Santarpanaja Vikara, Case report.

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INTRODUCTION

From the modern biomedical perspective, NAFLD is a multifactorial metabolic disorder characterized by excessive triglyceride accumulation in hepatocytes in the absence of significant alcohol intake and is strongly associated with obesity, insulin resistance,

dyslipidemia, metabolic syndrome, and physical inactivity. The currently accepted **multiple-hit hypothesis** explains its pathogenesis through insulin resistance, oxidative stress, mitochondrial dysfunction, inflammatory cytokines, lipotoxicity, and alterations in the gut microbiota ^[1]. These mechanisms exhibit

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remarkable similarities with the Ayurvedic concepts of *Agni Vaishamya*, *Ama formation*, *Dosha-Dhatu Vaishamya*, and *Srotodushti*, all of which culminate in impaired metabolism and hepatic dysfunction.

The increasing global prevalence of non-alcoholic fatty liver disease (NAFLD), particularly in developing countries such as India, necessitates an integrative understanding of its etiopathogenesis. Although NAFLD is not described as a distinct disease entity in classical Ayurvedic texts, its clinical and pathological features closely resemble *Santarpanajanya Vyadhi*, especially *Medoroga* and *YakritVikara*^[2]. Classical treatises such as *Charaka Samhita*, *Susruta Samhita*, and *Astanga Hridaya* attribute the condition to excessive consumption of *Madhura*, *Snigdha*, and *Guru Ahara*, along with sedentary lifestyle practices including *Avyayama* (lack of exercise) and *Divasvapna* (daytime sleep), which result in *Kapha Dosha Vriddhi* and *Meda Dhatu Vriddhi*^[3]. According to the concept of *Samprapti*, sustained indulgence in these etiological factors (*Nidana Sevana*) leads to the formation of excessively unctuous and sweet (*Atisnigdha*, *Madhuratara*) *Ahara Rasa*, which preferentially nourishes *Meda Dhatu* based on the principle of *Samanya-Vishesha Siddhanta*^[4]. Simultaneously, derangement of *Dhatvagni*, particularly increased *Medodhatvagni* with reduced *Pachaka Ansha*^[5], promotes excessive *Meda* accumulation within the liver, representing a state of metabolic dysregulation analogous to hepatic steatosis. As the disease progresses, accumulated *Meda* causes *Srotorodha* involving the *Rasavaha*, *Raktavaha*, and *Medovaha Srotas*, resulting in *Avarana of Vata*, impaired metabolic transport, and deposition of vitiated *Meda* in the *Yakrit*^[6]. Concurrent *Pitta Dushiti*, especially involving *Ranjaka Pitta*, contributes to inflammation, while progressive involvement of *Vata* leads to fibrosis and cirrhotic changes, closely paralleling the sequential progression of NAFLD from simple steatosis to non-alcoholic steatohepatitis (NASH), fibrosis, and cirrhosis.

Management of such metabolic disorders in Ayurveda primarily focuses on *Nidana Parivarjana* (removal of causative factors), *Ahara-Vihara* modification, and administration of appropriate *Aushadha*. Lifestyle correction and dietary regulation play a key role in improving metabolism and reducing fat accumulation. Among various Ayurvedic formulations, *Panchakola Churna*, composed of *Pippali*, *Pippalimoola*, *Chavya*, *Chitraka*, and *Shunthi*, is well known for its *Deepana*, *Pachana*, *Kapha-Medohara*, and *Agni-stimulating* properties, which help in correcting metabolic

disturbances and reducing pathological fat accumulation^[7].

Considering the increasing prevalence of fatty liver disease and the limitations of expensive diagnostic and therapeutic modalities, it is important to explore cost-effective and holistic approaches for its management. Therefore, the present study to evaluate the comparative clinical efficacy of lifestyle modification, dietary regulation, and *PanchakolaChurna* in its management. Provide sufficient background information to allow readers to understand and evaluate the result of the present study.

AIMS AND OBJECTIVES

Aim

The aim of this study was to assess the efficacy of *Panchakolachurna* along with dietary and lifestyle modifications in the management of non-alcoholic fatty liver disease.

Primary Objective

- To evaluate the effect of *PanchakolaChurna* along with dietary and lifestyle modifications in the management of Non-Alcoholic Fatty Liver Disease (NAFLD).

Secondary Objectives

- To assess the improvement in clinical symptoms, lipid profile, Liver function test and ultrasonographic findings.

MATERIALS AND METHODS

Case Report

A 52-year-old Female presented to the outpatient department with complaints of abdominal discomfort, fatigue, and excessive flatulence for the past one year. There was no history of alcohol consumption, smoking, or any other substance abuse. The patient's past medical history was unremarkable, with no evidence of diabetes mellitus, hypertension, or other significant systemic illnesses. On general physical examination, he was moderately nourished with a body mass index (BMI) of 27.9 kg/m². His vital signs were within normal limits. Abdominal examination revealed mild tenderness over the right hypochondriac region, with no palpable hepatomegaly or splenomegaly. Ultrasonographic evaluation of the abdomen demonstrated Grade II fatty liver changes. Laboratory investigations revealed dyslipidemia, characterized by elevated total cholesterol, triglycerides, and very-low-density lipoprotein (VLDL) levels, along with decreased high-density lipoprotein (HDL) levels.

Table no.1. Personal history

Bowel	Constipated
Sleep	Reduced
Appetite	Normal
Bladder	Clear

Table no.2.Ashtasthana pareeksha

Nadi	Vatha pithaja
Mutram	Anavilam
Malam	Badham
Jihwa	Nirama
Shabda	Sphutam
Sparsha	Anushna sheetham
Drik	Prakrit
Akriti	Madhyama

Interventions

Patient was advised to intake of *Panchakolachurna* with lifestyle and dietary modification for a period of 4 months. Follow ups was done oneach month. Aftercollectingthebaselinedata,patientswillbe evaluatedonthe clinicalfeatures,LFTandLipidprofile oneachvisit,USGwas done before and after thestudy.

1. PanchakolaCurṇa

Panchakolachurna is Mentioned in *SarangdharSamhita Madhyam Khand* (6/13-14)^[8].

Anupana- Lukewarm water.

Dose-3gm twice a day.

Given After food.

Route of administration-Oral.

Duration of therapy-4 months.

2.Lifestyle with dietary modification

Patients with NAFLD were advised lifestyle modification (Table no.3,4,5) alone, including restriction of total oil intake to 10–15 mL/day, consumption of 5–10 mL/day of ghee, avoidance of white sugar, and regular physical activity consisting of at least 30 minutes of brisk walking or 60 minutes of normal walking daily for a period of 4 months, as recommended in Harrison's Principles of Internal Medicine (Vol. 2, Ch. 364) ^[9].

Table No 3:Lifestylemodificationwith dietary changes

Food to avoid	Food to advise
Fattyfoods,non-veg, egg,yolk,dryfruits(cashewnut,walnut),Ghee,butter,milk-cream,preservedfood like pickle,colddrink,soft drink,saltshould be controlled	Daal(without fry), boiledvegetables, egg white, Bengalgram, barley

Table no.4.Aahara yojana (low salt law fat diet for fatty liver)

Time		Amount
1.Morning Tea (6:00 AM) (6:00 AM)	Tea/Coffee/Milk + (Biscuits without salt & cream)	100ml
2 Breakfast (8:30 AM) (8:30 AM)	Chapati (3–4) / Upma (1½–2 bowls) / Poha (1½–2 bowls) / Idli (3–4) + Sambar / Dal / Cooked vegetables (Do not consume coconut or groundnut chutney) OR Plain bread / Toast (slices) (Do not consume butter or jam) + Porridge / Oats / Cornflakes (¾ cup)	
3 Mid-Morning (10:30 AM)	Thin buttermilk (without salt or sugar) Fruits – 200 g Vegetable soup – 1 cup Tender coconut water – 1 cup	100ml

4. Lunch (1:00 PM)	Chapati (3–4) / Rice ($\frac{1}{2}$ –2 bowls) + Dal / Kadhi / Sambar Cooked vegetables Curd / Buttermilk Fruits (Apple, Orange, Sweet Lime, Papaya, Watermelon)	($\frac{1}{2}$ bowl rice = 1 chapati) 1 bowl 1 bowl 50 mL 100 g (4–5 slices)
5. Evening Meal (4:00 PM)	Tea/Coffee/Milk Marie Gold biscuits OR Plain bread / Toast (<i>without butter or jam</i>) OR Puffed rice (Lai/Farvi/Lava) OR Roasted gram	100 mL 2 slices $\frac{3}{4}$ bowl $\frac{1}{4}$ cup $\frac{1}{4}$ cup
6. Dinner (8:30 PM)	Same as lunch	

Table no.5.other dietary instructions to patients

Low-Salt Diet The following food items contain a high amount of sodium and should therefore be avoided: • Salt • Pickles • Dried fish • Baking powder • Sodium bicarbonate (cooking soda) • All canned food items • Cheese • Salted biscuits, dry fruits (cashew, almond, pistachio, etc.), popcorn, and chips • All types of papad • Soft drinks containing sodium benzoate • Sauces and ketchup • Instant soups (marketed soup powders such as Maggi Soup, Knorr Soup) • Horlicks, Boost, Bournvita, etc. • Ajinomoto (Monosodium Glutamate) Cook food with the minimum amount of salt and do not add extra salt while eating. Note: • Fruits should be consumed only once a day. • Tea/Coffee should be limited to not more than 2 cups per day. • If the patient has diabetes mellitus, extra sugar should not be added.

Table no.6.contents and properties of panchakolachurna

Name	Latin	Propotion	Partofuse		constituents	karma	Therapeut	ic
	name						Use	
Pippali	Piper	1 Part	Fruit	and	Essential oil	Vatahara	Pliharoga	
	longum		Root		And	Kaphahar	Amadosha	

					Alkaloids	deepanam	udararoga
						ruchya	swasa,kasa
						rasayana	gulma,jvara
						hridyam	prameha
						vrishyam	,arsha,kshaya,
							hikka, krimi
							kusta, shula
Pippalimula	Piper Longum	1 Part	Root		Alkaloids	Deepana	Udararogam
					(Piperine,	kapha hara	Anaha,
					Piperlongu	pachana	Gulma
					mine,Pipe	ruchya	krimiroga
					rlongumini	vatahara	
					ne)	vatanulom	
						ana	
						shulaprasa	
						manam	
Chavyam	Piper retrofactu m	1 Part	Fruit Root	and	Alkaloids	Deepanm	Agnimadhyam
					glycosides	kapha hara	adhmanam
					and steroids	pachanam	Pandu
						bhedanam	udararogam
						vatahara	Arshas, krimi
							gulma, shula
							amavatha
							Sula
Chitraka	Plumbago zeylanica	1 Part	Root bark		Plumbagin	Deepanam	Agnimand
						pachanm	Hyam
						kapha,	grihaniroga
						vatahara	
Nagara	Zingeber Officinale	1 Part	Rhizome		Essential	Vatahara	Amamdosham
					Oil	kaphahara	pliharogam
					Pungent	deepanam	udararogam
					constituen	amadosha	
					Ts	anuloman	
					(glycerol	a hridya	
					And		
					shshogool		
					)resinous		
					matter and		
					Starch		

OBSERVATIONS AND RESULTS

Results

Table No.7: Assessment of subjective parameters

Subjective parameters	Before treatment	After treatment
Loss of appetite	0	0
Constipation	3	0
Nausea	0	0
Abdominal pain and discomfort	2	0
Flatulence	3	0
Fatigue	3	0

Table No.8: Assessment of Objective Criteria

Assessment parameter	Before treatment	After treatment
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1.USG	Grade II fatty changes in liver	No abnormality detected
2.Liver function test	SGOT- 25.5 U/L SGPT- 26.2 U/L Bilirubin Total - 0.49 mg/dl Bilirubin Direct- 0.19 mg/dl Bilirubin Indirect - 0.29mg/dl	SGOT- 24.6 U/L SGPT- 26 U/L Bilirubin Total - 0.49 mg/dl Bilirubin Direct- 0.19 mg/dl Bilirubin Indirect - 0.29mg/dl
3.Lipid profile	Triglycerides - 150.7 mg/dl Total Cholesterol - 247.9mg/dl HDL Cholesterol - 50.1 mg/dl LDL Cholesterol - 157.6mg/d	Triglycerides - 120.7 mg/dl Total Cholesterol - 210.9mg/dl HDL Cholesterol - 50.8 mg/dl LDL Cholesterol - 130.6mg/d

DISCUSSION

NAFLD is characterized by the excessive accumulation of fat in hepatocytes in the absence of significant alcohol consumption. It has emerged as a major global health problem and is closely associated with obesity, insulin resistance, metabolic syndrome, and sedentary lifestyle. The prevalence of NAFLD is increasing worldwide and in India it ranges approximately between 9% and 32% in the general population^[10]. Although the disease is often asymptomatic in its early stages, it can gradually progress to liver fibrosis, cirrhosis, and hepatocellular carcinoma if not managed properly. These factors lead to *Kapha Dosha vriddhi* and subsequent *Meda Dhatu vriddhi*, which form the fundamental pathological basis of the disease.

The concept of *Medosamchaya in Yakrit* (Non-Alcoholic Fatty Liver Disease – NAFLD). The increasing global prevalence of NAFLD, particularly in developing countries like India, highlights the importance of exploring its etiopathogenesis through an integrative perspective. Classical Ayurvedic descriptions, though not directly naming NAFLD, provide a detailed conceptual framework that closely resembles the clinical and pathological features of fatty liver disease.

Panchakola Churna, comprising *Pippali*, *Pippalimoola*, *Chavya*, *Chitraka*, and *Shunthi*, demonstrates significant therapeutic efficacy in *Medosamchaya in Yakrit* (NAFLD) when understood in the context of the *Samprapti* described in the present study. *Panchakola Churna*, with its *Katu Rasa*, *Ushna Virya*, and *Tikshna Guna*, effectively counteracts these fundamental pathological changes^[11].

At the level of *Agni*, the *Samprapti* clearly indicates the presence of *Tikshnagni* or *Vishamagni* due to *Avarana* of *Vata* and *Kapha* predominance, rather than simple *Agnimandya*. *Panchakola Churna* acts by regulating this deranged *Agni* through its *Deepana* and *Pachana* properties, bringing it towards *Samagni*. By doing so, it prevents the formation of excessively *Snigdha* and *Madhura Ahara Rasa*, which is responsible for *Meda vriddhi*. Additionally, it helps in normalizing *Medo Dhatvagni* and correcting the imbalance between *Dhatvagni* and *Pachaka Ansha*, thereby reducing further *Meda* production and accumulation.

The *Samprapti* also emphasizes *Srotorodha* (*Sanga*) is a key factor in disease progression. *Panchakola Churna*, owing to its *Tikshna* and *Ushna* properties,

performs *Srotoshodhana* by removing this obstruction and restoring normal flow within the channels. This facilitates proper circulation of *Ahara Rasa* and prevents its abnormal conversion into *Meda*. Furthermore, by clearing the obstruction in *Medovaha Srotas*, it alleviates the *Avarana of Vata*, thereby restoring the normal functioning of *Samana* and *Vyana Vayu*, which are essential for digestion, absorption, and distribution of nutrients.

In accordance with the described *Samprapti*, the excessive *Meda* formed is of both *Abaddha* (circulating lipids) and *Baddha* (stored fat) types, which accumulate particularly in *Yakrit*^[12]. *Panchakola Churna* exerts a potent *Lekhana* and *Medohara* effect, which helps in reducing this pathological *Meda*. By virtue of its *Kapha-Medohara* action, it counteracts the *Guru*, *Snigdha*, and *Picchila Guna* of *Meda* and *Kapha*, thereby reducing hepatic fat deposition. Additionally, the formulation indirectly mitigates *Pitta* and *Rakta Dushti* at the *Yakrit* level by improving metabolic processes and preventing further inflammatory changes.

The individual components of *Panchakola Churna* possess bioactive phytochemicals that directly influence the pathogenesis of NAFLD. *Pippali* and *Pippalimoola* contain piperine^[13], while *Shunthi* is rich in gingerols and shogaols^[14], which exhibit significant antioxidant and anti-inflammatory activities, thereby reducing oxidative stress and hepatocellular injury associated with fatty liver. *Chitraka* contains plumbagin, known for its potent metabolic-stimulating and lipid-lowering effects, which aid in correcting deranged lipid metabolism and preventing excessive fat accumulation in the liver^[15], while *Chavya* contributes to enhanced digestive and metabolic activity.

Previous pharmacological studies have demonstrated that these phytoconstituents improve hepatic enzyme levels, enhance lipid metabolism, and reduce inflammatory changes in the liver. Thus, the combined phytochemical action of *Panchakola Churna* supports its role in breaking the core pathology of NAFLD by targeting oxidative stress, inflammation, and abnormal lipid deposition in hepatocytes.

LIFESTYLE WITH DIETARY MODIFICATION

Non-alcoholic fatty liver disease (NAFLD) is closely associated with modifiable lifestyle factors, particularly dietary patterns and physical inactivity, which contribute to the development of insulin resistance,

central obesity, and hepatic fat accumulation. Diets rich in refined carbohydrates, added sugars (especially sugar-sweetened beverages such as tea and coffee), and excess caloric intake promote hepatic de novo lipogenesis, leading to triglyceride deposition within hepatocytes. Conversely, dietary modification focusing on calorie restriction, reduction of simple sugars, and adoption of a balanced diet rich in whole grains, fruits, vegetables, lean protein, and healthy fats has been shown to improve metabolic parameters and reduce liver fat. Increased intake of fiber and antioxidants further helps in reducing oxidative stress and inflammation, thereby preventing disease progression.

Lifestyle modification, particularly regular physical activity, plays a crucial role in the management of NAFLD. Both aerobic exercise and resistance training improve insulin sensitivity, enhance fatty acid oxidation, and reduce visceral adiposity, which are key mechanisms in decreasing hepatic fat content. Even in the absence of significant weight loss, exercise has been demonstrated to reduce liver fat and improve liver enzyme levels. A combination of moderate-intensity aerobic activity and strength training is therefore recommended to achieve optimal metabolic benefits [16].

Sustained weight reduction through dietary and lifestyle interventions remains the cornerstone of NAFLD management. A weight loss of approximately 5–10% has been associated with significant improvement in hepatic steatosis, inflammation, and even fibrosis in some cases. These beneficial effects are mediated through improved insulin sensitivity, decreased hepatic lipogenesis, reduced inflammatory cytokine production, and enhanced lipid metabolism. Therefore, comprehensive lifestyle modification integrating diet control, regular exercise, and behavioural changes is essential for both prevention and reversal of NAFLD and its progression to more advanced liver disease.

Collectively, these interventions worked synergistically to reduce hepatic fat deposition, improve lipid metabolism, and relieve associated symptoms such as fatigue and abdominal discomfort. On follow-up, significant improvements were observed in liver function tests (LFTs), lipid profile parameters, ultrasonographic findings, and clinical symptoms. These findings suggest a favourable role of Ayurveda in modulating disease progression in non-alcoholic fatty liver disease (NAFLD). Although this is a single case and the results cannot be generalized, it highlights the importance of an integrative management approach and the potential of Ayurvedic therapies to complement modern treatment strategies. Further large-scale clinical studies with biochemical and imaging-based endpoints are required to validate these findings and establish standardized treatment protocols.

CONCLUSION

This case demonstrates the potential effectiveness of Ayurvedic management in patients with non-alcoholic fatty liver disease (NAFLD). The administration of a single Ayurvedic formulation, *Panchakola Churna*, along with appropriate lifestyle and dietary modifications, resulted in significant clinical improvement, regression of fatty liver grade, and better symptomatic relief. These findings indicate that Ayurveda may serve as a promising complementary approach in the management of NAFLD, particularly among patients with metabolic disturbances and dyslipidaemia. However, as this is a single case report, the findings cannot be generalized. Further well-designed clinical studies with larger sample sizes are required to validate these outcomes and establish standardized integrative treatment protocols

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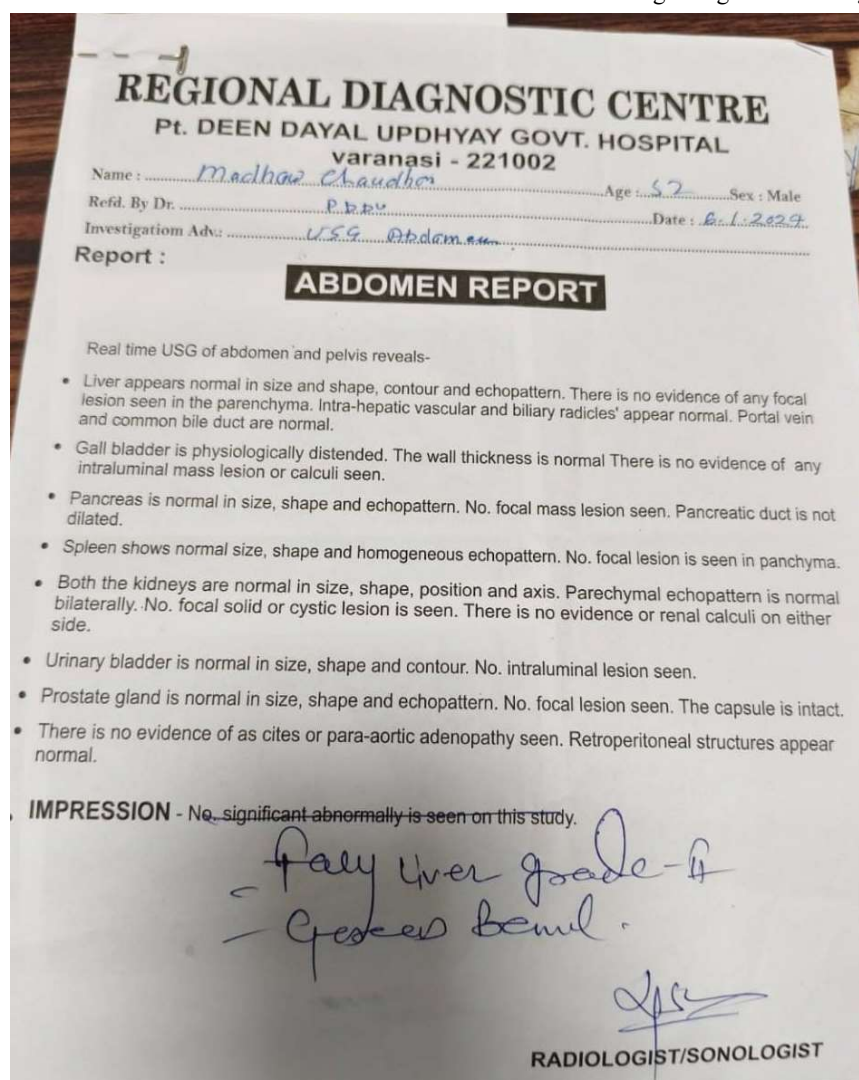


Figure No.1 .Showing USG Report of the patient before treatment

REGIONAL DIAGNOSTIC CENTRE
Pt. DEEN DAYAL UPDHYAY GOVT. HOSPITAL
varanasi - 221002

Name : महेश्वर शर्मा Age : 52y Sex : Male
Refd. By Dr. : Date : 22.5.24
Investigation Adv. : USG
Report :

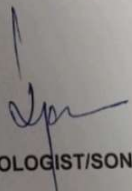
ABDOMEN REPORT

Real time USG of abdomen and pelvis reveals-

- Liver appears normal in size and shape, contour and echopattern. There is no evidence of any focal lesion seen in the parenchyma. Intra-hepatic vascular and biliary radicles appear normal. Portal vein and common bile duct are normal.
- Gall bladder is physiologically distended. The wall thickness is normal. There is no evidence of any intraluminal mass lesion or calculi seen.
- Pancreas is normal in size, shape and echopattern. No. focal mass lesion seen. Pancreatic duct is not dilated.
- Spleen shows normal size, shape and homogeneous echopattern. No. focal lesion is seen in panchyma.
- Both the kidneys are normal in size, shape, position and axis. Parenchymal echopattern is normal bilaterally. No. focal solid or cystic lesion is seen. There is no evidence of renal calculi on either side.
- Urinary bladder is normal in size, shape and contour. No. intraluminal lesion seen.
- Prostate gland is normal in size, shape and echopattern. No. focal lesion seen. The capsule is intact.
- There is no evidence of as cites or para-aortic adenopathy seen. Retroperitoneal structures appear normal.

• **IMPRESSION** - No. significant abnormality is seen on this study.

NAD


RADIOLOGIST/SONOLOGIST

Doctor's Name
Signature / Date

*चुनाव का पर्व, देश का गर्व (१ जून को अवश्य मतदान करें)**** ORS बनाने की विधि*** (1)-१ ली. स्वच्छ /उबाला हुआ ठंडा पानी (2)-०६ चम्मच चीनी (3)-१/२ छोटा चम्मच नमक (नोट)-मिश्रण को तब तक हिलाए जबतक कि नमक और चीनी घुल न जाए।

Figure No.2 Showing USG of the patient after 4 months of treatment