

# Unique Pathology Finding in Bush Tea Mediated Hepatopathy: A Case Report

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## Abstract

Herbal medications have been used worldwide in place of conventional medical therapies as they are readily available over the counter and usually are lower cost. Currently, these are not tightly controlled by the Food and Drug Administration agency (FDA). However, herbal medications are always overlooked etiologic agents in hepatotoxicity. We present a case of hepatotoxicity with unique pathology findings from Red Bush Tea (Rooibos Tea) consumption in a 39-year-old patient evaluated for elevated liver enzymes. Biopsy showed a congestive hepatopathy pattern on histology. The patient elevated liver enzymes improved within few weeks after stopping bush tea.

**Keywords:** Bush tea • Drug induced liver injury • Congestive hepatopathy • Transaminitis

## Introduction

The use of herbal medications can be traced to centuries back, and it has only been expanding since then. One of the commonly used herbal medications is Rooibos Tea, also known as Red Bush Tea. The use of Rooibos tea has increased exponentially in the last decade. It is usually made using leaves from a shrub called *Aspalathus Linearis*, which typically grow in the western coast of South Africa. Traditionally, rooibos has been used for its medicinal properties in South Africa. However, there is already extensive evidence showing that drinking two to three cups of tea daily could be beneficial for health. They are sweet, aromatic, caffeine-free, and low in tannins. The proposed health benefits include the anti-hypertensive effects, antioxidant properties, decreasing LDL, anti-diabetic, anti-inflammatory effects, and potential effects in alleviating allergies, asthma, dermatological conditions, and infantile colic. These properties are probably due to a high content of polyphenols and flavonoids [1,2].

## Case Presentation

A 39-year-old male with no remarkable medical history was referred for persistently elevated liver enzymes. He complained of abdominal bloating but no fatigue, jaundice, pruritus, abdominal pain, distension, changes in stool or urine color. He had been drinking multiple cups of Red Bush tea (Rooibos tea) daily. He did not have any personal or family history of liver disease. He drinks alcohol occasionally about two drinks of wine a month. On physical exam, the patient was afebrile and had no jaundice or scleral icterus or abdominal tenderness. He had no asterixis, spider angiomas, ascites or hepatosplenomegaly. Laboratory tests showed Alanine Transaminase (ALT) was 87 U/L, and Aspartate Transaminase (AST) was

60 U/L, normal total bilirubin, alkaline phosphatase, albumin, platelet count and INR. Tests for viral hepatitis and HIV were negative.

Extensive evaluation for autoimmune hepatitis, Wilson disease, Hemochromatosis, and Celiac disease was negative. MRI of the abdomen with contrast showed a stable solitary enhancing gallbladder wall polyp with unremarkable liver and bile ducts and no ascites. A liver biopsy was obtained, which showed congestive hepatopathy with sinusoidal and central vein dilation throughout the biopsy specimen. Preserved/normal architecture with no significant steatosis, lobular inflammation, or hepatocyte ballooning was also noted. The portal tracts had no significant chronic inflammation or activity and there was no significant bile duct damage or proliferation. The iron stain was negative, and the trichrome stain showed no bridging fibrosis (Figure 1). Our case did meet the diagnostic criteria for liver injury due to herbal supplements. Eventually, the liver transaminases improved after stopping the red bush tea.

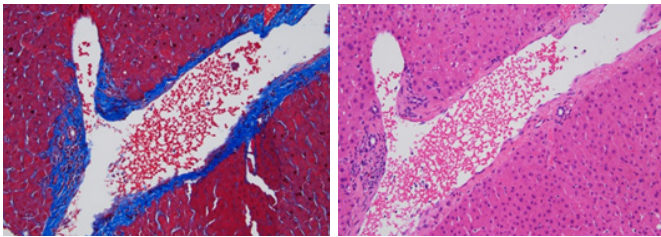
Red Backcountry tea or rooibos tea, deduced from the dried leaves of a South African factory (*Aspalathus linearis* (Burm.f.)R.Dahlgren), is consumed worldwide by numerous people for its proposed health benefits similar as relief of immature bellyache, asthma, disinclinations, malice, dermatologic, and seditious diseases. It's caffeine free, low in tannins, sweet and readily available at most supermarkets and popular coffee chains in the United States. The fresh splint contains polyphenols similar as flavanols, dihydrochalcones, aspalathin, and nothofagin and the reused leaves and stem contain benzoic and cinnamic acids. Red bush tea is consumed worldwide by many for its proposed health benefits. Patients should be asked directly about use of herbal medicines. Our patient's elevated transaminases may be due to excess red bush tea ingestion. Our careful anesthetic management avoided further derangement in liver function.

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Numerous conventional medicines used moment, including isoniazid, dapsones, and acetaminophen, are well honored lawbreakers of hepatotoxicity. With adding use of reciprocal and indispensable medical curatives, several herbal drugs, similar as Ma-Huang, kava, and chaparral splint, have been intertwined as hepatotoxins. Hepatotoxicity may be the most frequent adverse response to these herbal remedies when taken in inordinate amounts. A myriad of liver dysfunctions may do including flash liver enzyme abnormalities due to acute and habitual hepatitis. These herbal products are frequently overlooked as the unproductive etiologic agent during the evaluation of a case with elevated liver function tests. Elevated liver enzymes and thrombocytopenia detected in the case's laboratory work up confounded the original opinion of acute appendicitis and fresh examinations were needed to rule out cholecystitis and other causes of hepatitis. Open appendectomy was done uneventfully under spinal anesthesia without any farther deterioration of hepatic function.



**Figure 1.** Trichome stain showing features of portal vein and central vein dilation and sinusoidal diathesis.

## Results

Dietary herbal supplements induced liver damage is one of the causes of elevated liver enzymes which are likely to be missed on routine evaluation as many of the patient fail to report it. People usually think with the word "Natural" attached to it makes them free of side effects. Many of them did not even consider these as medication. Especially in the modern era where people are focusing more on herbal supplements than before. Therefore, a thorough history, physical exam, and drug reconciliation, including non-drug supplements and herbal remedies, should always be included in patients with unexplained elevated liver enzymes especially after ruling other causes of liver injury. Although our case discusses adverse hepatic effects of rooibos tea, it has an excellent safety record [3], and further studies are required to resolve this question. Finally, our case points at the importance of encouraging patients to report any use of dietary supplements, including herbal products, in the settings of a suspected adverse drug reaction or interaction.

## Discussion

Since numerous medications/drugs are metabolized in the liver, drug-induced liver damage is commonly seen. However, many herbal medications have been implicated in liver cell damage, e.g., oil clove, palmetto and kava, chaparral, germander, and *Camellia sinensis* (green tea). The degree of the injury is variable ranging from elevated liver enzymes to as severe as liver cirrhosis [4].

Herbal-induced liver damage has been reported in many cases and studies. In addition, bush tea usage has been associated with liver injury, elevated liver function tests, and thrombocytopenia. Liver biopsy of patients with herbal tea mediated hepatitis usually shows hepatocellular necrosis, Cholestasis or mixed inflammatory infiltrates with abundant eosinophils. In contrast, our patient was found to have sinusoidal and central vein dilation findings, which may be an under-reported histopathological presentation associated with Rooibos tea consumption. Hepatotoxicity is likely being due to the unknown biochemical components of herbal teas due to small-batch manufacturing. Previous published reports revealed herbal supplements to

be a causative agent in 9-11% of cases with drug induced liver injury [5,6].

Our patient transaminases improved after he stopped taking the red bush tea which confirms the direct association between this herbal supplement and liver injury. The patient also had no reason for the congestive hepatopathy pattern on histology including vascular abnormalities on imaging, cardiac or pulmonary comorbidities.

## Conclusion

Dietary herbal supplements induced liver damage is one of the causes of elevated liver enzymes, which is likely to be missed on routine evaluation as many patients fail to report it. Therefore, a thorough history, physical exam, and drug reconciliation, including non-drug supplements and herbal remedies, should always be included in patients with unexplained elevated liver enzymes.

## Declarations

### Data availability

The authors confirm that the data supporting the findings of this study are available upon request.

## Animal Research

This article does not contain any studies with animals performed by any of the authors.

Consent to participate/for Publication: Informed consent was obtained from patient included in the study.

## Plant Reproducibility

Not applicable

## Clinical Trials Registration

Not applicable

## Author's Contributions

Hany Eskarous: Case report & Discussion writing, Literature review, choosing references

Jared Hassler: Content review, provided pathology slides.

Kimberly Forde: Final review

## Funding

None

## Conflict of Interest

Hany Eskarous, Jared Hassler, Kimberly Forde declare that they have no conflict of interest.

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