LETTERS TO THE EDITOR

Shifting trends of liver cirrhosis: causes, complications and future outlook

To the Editor,

Liver cirrhosis is an irreversible condition that is responsible for significant morbidity and mortality with over 2.4% of global deaths attributed in 2019 [1]. The epidemiological landscape of the etiology of liver cirrhosis has changed globally in last years. A shift from infectious diseases to noninfectious causes of liver cirrhosis, such as metabolic-associated fatty liver disease (MAFLD) associated with diabetes and obesity, was observed. Immunization against hepatitis B virus (HBV) and direct-acting antivirals against hepatitis C virus (HCV) have led to a decrease in the prevalence of infectious causes of liver cirrhosis.

Globally, liver cirrhosis claimed more than 1.47 million lives in 2019, with HCV being the leading cause accounting for 26.9% of the cases [2]. However, during the same period, an increase in the number of cases of MAFLD were observed growing by 26.7%. In developed countries like the United States, between the years 2013 and 2016, MAFLD cases rose from 20% to 31.9%, a concerning trend. Regionally, in South Asia, liver cirrhosis has proven to be a significant burden with high prevalence reported in countries like India and Pakistan, two of the top 5 highest populated countries in the world [3]. Despite rigorous vaccinations and treatments, HBV and HCV continue to be major contributors to liver cirrhosis. Surprisingly increased obesity rates and poor eating habits are causing MAFLD to become a major factor in cirrhosis. By 2030, it is anticipated that the prevalence of MAFLD will increase by 20% just in India [4].

Pakistan, the 5th populous country faces a significant burden in terms of morbidities and mortalities associated with liver cirrhosis. Historically, HBC and HCV have been the leading cause of liver cirrhosis. However, vaccination campaigns, similar to those observed globally, have shifted the etiology from infectious to non-infectious causes. Different studies have reported HCV being responsible for about 50-70% of liver cirrhosis cases [5]. Recent trends due to sedentary lifestyles have significantly shifted the rising trends of MAFLD-related liver cirrhosis.

Complications of liver cirrhosis such as ascites, spontaneous bacterial peritonitis, and hepatocellular carcinoma have been observed affecting around 10% to 30% of the patients leading to high fatality rates [6]. Other complications like hepatic encephalopathy and variceal bleeding, have drastically reduced life expectancy with 6-week mortality rates of up to 17.7% after episodes of variceal bleeding. The complications of liver cirrhosis in Pakistan are severe and continue to rise like in other low-middle income countries due to insufficient healthcare system infrastructure. Without significant intervention, MAFLD cases and their impact on causing liver cirrhosis are expected to rise [4]. It is of paramount importance that clinicians, public health workers, and policymakers collaborate to target the rising cases of MAFLD educating the general public to adopt healthier lifestyles. Moreover, early screening of high-risk individuals should also be initiated to curb the rising trends of MAFLD-associated liver cirrhosis.

To conclude, liver cirrhosis is emerging to be a serious public health challenge not only in developed countries but also in developing countries with shifting trends from infectious to non-infectious causes. It is imperative to pay attention to the burden of this disease, especially in countries like Pakistan with limited resources to screen and manage such patients.

Abhishek Lal[1], Aqsa Amjad[2], Syeda Samnita Batool Zaidi[2], Om Parkash[1]
1) Section of Gastroenterology, Department of Medicine, Aga Khan University, Karachi; 2) Aga Khan University, Karachi, Pakistan

Correspondence: Om Parkash, om.parkash@aku.edu

Conflicts of interest: None.
DOI: 10.15403/jgld-5929

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Colovenous fistula?

To the Editor,

We would like to begin by thanking Mustafa et al. [1] for drawing attention to a condition that can develop on the basis of complicated diverticulitis - namely, colovenous fistula and pylephlebitis. We would now like to offer several critiques regarding their case report.

In the text, the authors mention the presence of free air in the inferior mesenteric vein (IMV) on computed tomography (CT) scans. However, the CT images they provided do not appear to include the cross-sectional area of the IMV. As is well known, the IMV is formed by the confluence of colonic tributaries and courses proximally in front of the left renal vein and Gerota's fascia. It then passes to the left of or behind the duodenojejunal flexure and drains primarily into the splenic vein, though less frequently into the superior mesenteric vein (SMV) or the junction of the SMV and splenic vein [2]. Because the CT images presented in the article depict the pelvic region at the level of the sigmoid colon, the IMV is not visualized at this location.

In Fig. 2 [1], the authors state that air and contrast material are observed in the sigmoid branches of the IMV. However, as can be seen, the section inFig. 2 [1] closely resembles that of Fig. 1 [1] - namely, the markedly distal region beyond the iliac bifurcation (not visible in the image), within the pelvis corresponding to the sigmoid colon. The air- and contrast-filled spaces indicated by the arrow could very well represent the diverticula located superior to the sigmoid colon, similar to those shown in Fig. 1 [1]. Indeed, the images in the literature also appear as we have described [3].

To establish a diagnosis of colovenous fistula, one must first visualize the inferior mesenteric vein itself. Furthermore, most reports in the literature describing colovenous fistula detail the presence of contrast medium within the IMV, rather than air. The presence of air in the IMV, alongside thickening of its wall, has been described as pylephlebitis [4-6].

While this case report serves as a useful reminder and informative example regarding the complications of complicated diverticulitis, the omissions noted above diminish its demonstrative value and cast doubt on the diagnosis.

Idris Kurt
Gastroenterology Department, Trakya University School of Medicine, Edirne, Turkey

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Reply

To the Editor,

We thank Idris Kurt for reading our manuscript „Diverticulitis with Colovenous Fistula and Pylephlebitis: Imaging Findings of a Rare Case" [1] and for its comments [2].

As the author states, none of the figures presented in our paper contain a computed tomography (CT) cross-section of the IMV. Due to the journal's rule of not exceeding three figures for papers in the „Image of the Issue" format, comprehensive images of our case could not be presented in our paper. Although the text mentions air density in the IMV, this statement is actually based on findings from our other images that could not be presented in our paper. In response to the author's criticisms, we are presenting below a figure showing the IMV and its sigmoidal branches (Fig. 1). This figure better demonstrates both the air densities in the IMV and the air densities and oral contrast material in the sigmoidal branches of the IMV.

There is a valid aspect to the author's criticism that „In Fig. 2 [1], the authors state that air and contrast material are observed in the sigmoid branches of the IMV. However, as can be seen, the section in Fig. 2 [1] closely resembles that of Fig. 1 [1] - namely, the markedly distal region beyond the iliac bifurcation (not visible in the image), within the pelvis corresponding to the sigmoid colon. The air- and contrast-filled spaces indicated by the arrow could very well represent the diverticula located superior to the sigmoid colon, similar to those shown in Fig. 1 [1]." However, sigmoid diverticula and the sigmoid branches of the IMV are neighboring anatomical structures. Since they are adjacent, gas and contrast material in both the diverticula and the venous system can show similar findings on CT. In Fig 1 corresponding to this paper, contrast

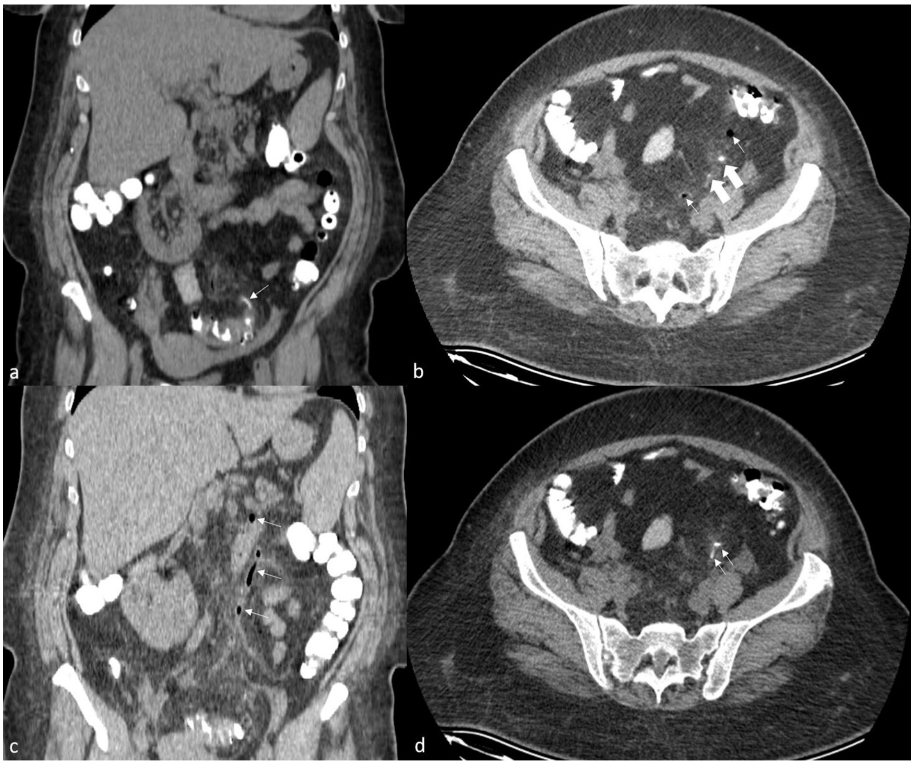

Fig. 1. Characteristic findings of colovenous fistula are clearly demonstrated in axial (b, d) and coronal (a, c) computed tomography (CT) images of the same patient. The CT images were obtained using oral contrast material without the use of intravenous contrast material. a-d. Oral contrast material is observed filling multiple sigmoid branches of the inferior mesenteric vein (IMV) (arrow). b. Differential filling patterns are evident within the sigmoid branches of the IMV, with some branches demonstrating oral contrast opacification (thick arrows) while others exhibit intraluminal gas densities (thin arrows). c. The gas densities within the IMV lumen (arrows) support the diagnosis of colovenous fistula.

material in the sigmoid branches of the IMV is clearly visible and can be distinctly differentiated from diverticula.

We disagree with the author‘s statement that „To establish a diagnosis of colovenous fistula, one must first visualize the inferior mesenteric vein itself." Because gas and oral contrast material must pass through its branches before reaching the IMV. Therefore, gas and oral contrast material will be seen primarily in the sigmoid branches of the IMV on CT. Detection of these substances in the sigmoid branches, as in the IMV, demonstrates the fistulous connection between the colon and the venous system.

Mustafa Koyun[1], Bunyamin Ece[2]

1) Kastamonu Training and Research Hospital, Department of Radiology, Kastamonu; 2) Kastamonu University, Department of Radiology, Kastamonu, Turkey

Correspondence: Mustafa Koyun, dr.mustafakoyun@gmail.com

Conflicts of interest: None.
DOI: 10.15403/jgld-6209

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Tattoo ink: Does it really stay in the skin? A potential link between tattoos and leukemia in fatty liver disease patient

To the Editor,

We read with great interest the recent article on the association between tattoos and lymphomas by Nielsen et al. [1]. The study underscores the potential risks associated with tattooing, a practice that has gained widespread popularity over the last few decades. While the association between tattoos and lymphomas has been explored in the literature, the potential link between tattoos and leukemia remains under-investigated. Herein, we present a case that may suggest such an association, which warrants further scientific exploration.

We report the case of a 59-year-old male patient, a known case of hypertension, chronic obstructive pulmonary disease, and a herniated disc at the L4-L5 level, which had been surgically treated. The patient presented to our medical department for dark stools that started 3 days prior to his admission. On physical examination, no significant abnormal findings were noted. Nevertheless, the patient had a large, solid black tattoo covering most of his abdomen, which he had acquired spanning two decades, as shown in Fig 1. The tattoo featured a bold, simplistic design without detailed shading or intricate line work, relying entirely on black ink for its impact. Extending from the lower chest to the pelvic region, this expansive tattoo involved a significant amount of black ink, raising concerns about the long-term systemic exposure to the ink's chemical components, especially given the tattoo's extensive coverage.

Fig. 1. A large, solid black tattoo covering most of the patient's abdomen.

Laboratory tests indicated markedly increased white blood cells, mainly neutrophils, severe hyperchromic macrocytic anemia, low iron levels, elevated vitamin B12, increased lactate dehydrogenase (LDH), and elevated gamma-glutamyl transferase (GGT). Additionally, peripheral blood smear revealed a left shift in the leukocyte formula extending to myeloblasts, with the presence of blasts (myeloblasts, lymphoblasts) and promyelocytes, indicating a malignant hematologic abnormality. Abdominal ultrasound revealed biliary sludge, diffuse hepatic echogenicity enhancement, rendering periportal echogenicity indistinct, indicating grade II hepatic steatosis, and splenomegaly measuring approximately 150 mm in the long axis. Fibrosis-4 (FIB-4) index for liver fibrosis was calculated, with an obtained score of 1.47 points, interpreted as an intermediate-risk. Electrocardiogram showed normal sinus rhythm with a heart rate of 63 bpm and no significant abnormalities. Due to melena, upper gastrointestinal endoscopy was performed, identifying multiple fibrin-covered ulcerations. Multiple biopsies were taken, confirming *Helicobacter pylori (H. pylori)* infection, for which eradication therapy was recommended. Considering the pathological hematological findings, the patient was tested for *BCR-ABL* mutation and diagnosed with chronic myeloid leukemia (CML), with positive *BCR-ABL* mutation. Treatment with hydroxyurea was initiated, followed by Dasatinib. A follow-up three months later showed improvement in clinical status and laboratory results.

Of particular interest, the patient had tattoos, which he had acquired over the past two decades. This raises the question of whether there might be a link between his long-standing tattoos and the development of CML. The potential mechanisms through which tattoo pigments could contribute to leukemogenesis remain speculative. However, it is known that certain tattoo inks contain heavy metals and other potentially carcinogenic substances, which could theoretically enter systemic circulation and affect bone marrow or other hematopoietic tissues [2]. Chronic exposure to these substances could, in theory, contribute to the initiation of leukemogenesis in susceptible individuals.

Current literature has provided some insights into the association between tattoos and lymphomas. For instance, a review by Islam et al. [3] identified multiple published cases of tattoo-associated lymphomas, suggesting that the introduction of foreign substances into the skin might trigger an immune response that could potentially lead to lymphomagenesis. It was noted that tattoos, especially those with black ink, often contain carbon-based pigments, which have been implicated in chronic inflammation and granuloma formation [4]. Chronic inflammation is a known risk factor for the development of various cancers, including lymphomas.

Further, the study by Moehrleet al. [5] examined the presence of tattoo pigments within lymph nodes of a patient who had undergone lymphadenectomy for melanoma. They found that tattoo pigments were present in the lymph nodes of some patients, raising concerns about the long-term effects of these pigments on the immune system. This finding supports the hypothesis that the presence of foreign particles in the lymphatic system might contribute to the development of lymphoproliferative disorders, including lymphomas.

Additionally, Carotenuto et al. [6] highlighted the potential for tattoo inks to cause systemic effects beyond local skin reactions. The study pointed out that tattoo inks could contain nanoparticles capable of penetrating the skin and entering the bloodstream, where they could potentially induce genotoxic effects or contribute to the formation of reactive oxygen species. Both of these mechanisms have been implicated in carcinogenesis, including the development of hematologic malignancies.

Given that both lymphomas and leukemias are hematologic malignancies with potentially shared etiological factors, it is plausible that similar mechanisms may underlie their development in tattooed individuals. This hypothesis, however, has yet to be tested in rigorous scientific studies.

Interestingly, emerging research suggests a potential link between *H. pylori* infection and CML, likely due to the infection's ability to promote chronic inflammation and immune system dysregulation [7]. While *H. pylori* infection can lead to a pro-inflammatory state, which might contribute to leukemia development, direct evidence supporting this connection remains limited. Further investigation is necessary to establish whether *H. pylori* infection could be a risk factor for CML or play a role in its pathogenesis.

Moreover, the current evidence linking fatty liver disease (FLD) to an increased risk of leukemia is sparse and primarily suggests indirect associations through mechanisms like chronic inflammation and metabolic dysfunction [8]. While FLD has been correlated with systemic inflammation, a factor in cancer development, no robust studies demonstrate a direct causative relationship with leukemia.

Conversely, chemotherapy treatments can exacerbate or directly cause hepatic steatosis and non-alcoholic steatohepatitis (NASH) [9]. These conditions, induced by treatment-related oxidative stress and metabolic alterations, pose significant challenges by increasing liver toxicity, complicating cancer treatment, and potentially worsening patient outcomes.

We propose that future epidemiological and mechanistic studies investigate the possible association between tattoos, leukemia, FLD, and *H. pylori* infection. Such studies could provide valuable insights into the risks associated with tattooing, particularly in individuals with predisposing factors for hematologic malignancies, as well as the associated risk in FLD and *H. pylori* patients. Until such data are available, clinicians should remain vigilant when assessing tattooed patients presenting with hematologic abnormalities.

In conclusion, while our case report is limited by its anecdotal nature, it highlights a potential link between tattoos and leukemia that merits further investigation. Furthermore, it outlines gaps in evidence regarding the associated hematological risk in FLD and *H. pylori* patients. We call upon the scientific community to explore this hypothesis through well-designed studies, which could ultimately contribute to better understanding the risks associated with tattooing and its long-term health implications.

Abdulrahman Ismaiel[1], Ioana Rusu[1], Anca Bojan[2], Dan L. Dumitrascu[1]
1) 2nd Department of Internal Medicine, Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca; 2) Department of Hematology, Ion Chiricuta Oncology Institute Cluj-Napoca, Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania

Correspondence: Abdulrahman Ismaiel,
abdulrahman.ismaiel@yahoo.com

Conflicts of interest: None.
DOI: 10.15403/jgld-6052

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Leukocytoclastic vasculitis as a rare adverse effect of ustekinumab in a patient with Crohn's disease

To the Editor,

A 20-year-old female patient with ileocolonic Crohn's disease presented to our outpatient clinic with bloody diarrhea and abdominal pain. She described 4-5 bloody stools with daily mucous discharge. Colonoscopy revealed fibrotic stenosis, pseudopolyps in the sigmoid colon, and hyperemia in the rectum.

At 16 years of age, our patient was diagnosed with ileocolonic Crohn's disease and was subsequently prescribed mesalamine and azathioprine. After a while, infliximab treatment was started due to a lack of response. However, in the second year of infliximab treatment, a severe allergic reaction was observed, and the treatment was changed to adalimumab. Azathioprine was discontinued during follow-up in the patient who required frequent iron replacement due to severe anemia. On adalimumab treatment, a flare occurred, and intravenous (i.v.) methylprednisolone was started for remission induction. However, since complete remission was not achieved with adalimumab, it was decided to open ileostomy considering the stenosis in the sigmoid colon and initiated ustekinumab treatment instead of adalimumab.

An intravenous loading dose of 260 mg of ustekinumab was administered after loop ileostomy. In the third week following ustekinumab loading, the patient presented with a widespread rash (Fig. 1a) on the bilateral lower extremities . As the rash resolved spontaneously during follow-up, the patient received a second dose of ustekinumab. The rash recurred in a more generalized manner (both upper and lower extremities) following the second dose and was considered to be drug-related. Consequently, the ustekinumab treatment was discontinued.

Skin biopsy revealed leukocytoclastic vasculitis (Fig. 1 b,c,d). The rash entirely resolved six weeks after the initiation of oral and topical steroid treatment. After discontinuation of ustekinumab, treatment was continued with upadacitinib, a Janus kinase inhibitor, and the rash did not recur under upadacitinib treatment. During follow-up, there was a noticeable improvement in clinical status.

Drugs play a key role in cutaneous vasculitis. Although almost all drugs may be a potential cause, cephalosporins and penicillin among antibiotics, phenytoin and allopurinol among sulfonamide group are the drugs most associated with vasculitis [1]. Other causes include IBD, connective tissue diseases, malignancies and underlying chronic diseases [2].

There is evidence of a significant relationship between disease activity and leukocytoclastic vasculitis in inflammatory bowel diseases [3]. In our case, leukocytoclastic vasculitis was not observed in the patient's history, even during the active

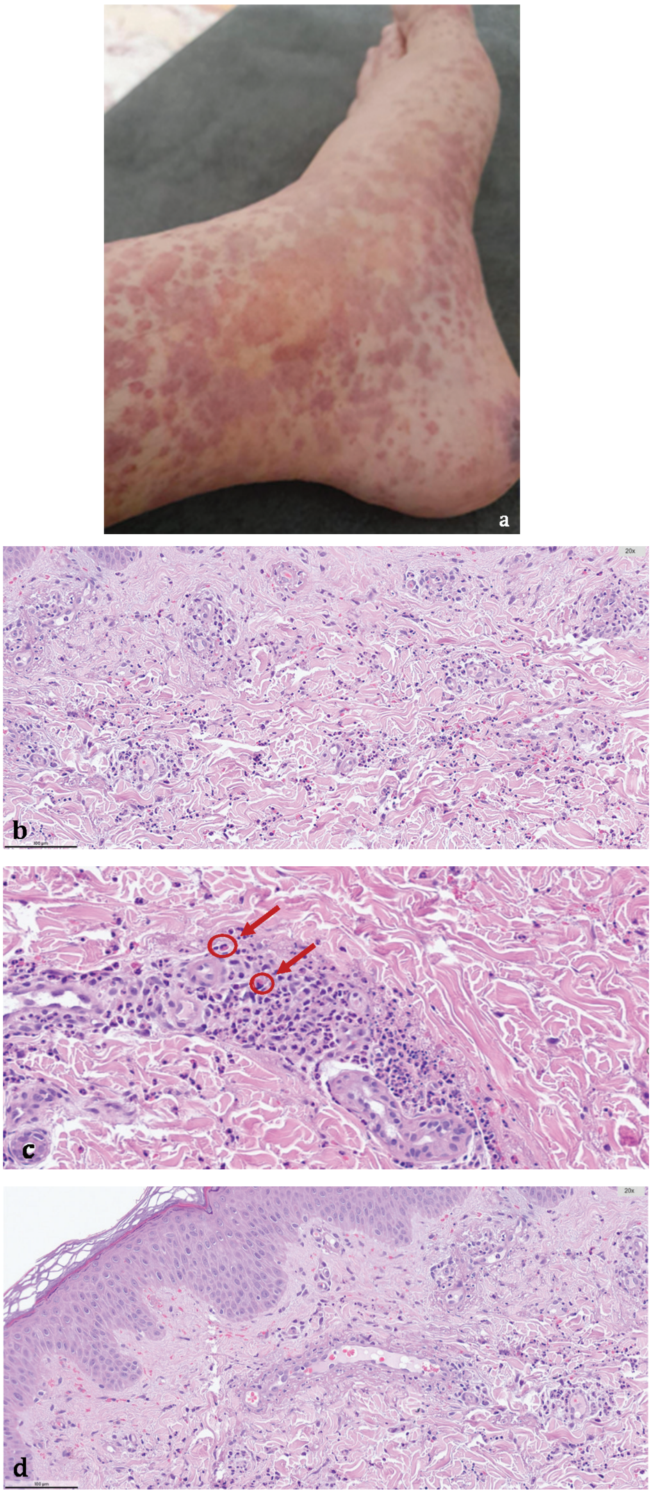

Fig. 1. a) Rash on lower limb following the second dose of ustekinumab; b) Erythrocyte and fibrin extravasation, image of vasculitis; c) inflammation involving neutrophils (H); d) (H&E, x20) Eosinophils in the red circle.

disease period. Given that vasculitis developed approximately three weeks after the first dose of ustekinumab, it was concluded that the etiology was drug-related rather than IBD.

Drug-induced cutaneous vasculitis usually develops within 1 to 3 weeks after the initiation of medication [4]. Many biological agents currently used to treat inflammatory diseases may cause autoimmune events, including psoriatic lesions, alopecia, lupus, and leukocytoclastic vasculitis. Considering the frequency of use, anti-TNF drugs take the lead.

Cases of leukocytoclastic vasculitis after initiation of ustekinumab are quite rare, and in these cases, the time to rash development and the duration of drug use are quite variable. A case of leukocytoclastic vasculitis after three years of ustekinumab use has also been reported [5]. In our case, leukocytoclastic vasculitis developed three weeks after ustekinumab initiation, and the lesions persisted after the second dose, which confirmed our diagnosis.

To the best of our knowledge, this is the first case in our country. Although ustekinumab-associated leukocytoclastic vasculitis is rare, its frequency is expected to increase as the drug has become more widely used in recent years. It is crucial to suspect leukocytoclastic vasculitis, especially in IBD patients who develop rash after drug administration, subsequently cease treatment, and switch to other options when the diagnosis is confirmed.

Hüseyin Aykut[1], Baver Ordu[1], Berkay Dertsiz[1], Gupse Adalı[1], Özben Yalçın[2]

1) Department of Gastroenterology, University of Health Sciences, Umraniye Training and Research Hospital, Istanbul; 2) Department of Pathology, University of Health Sciences, Prof. Dr. Cemil Taşçıoğlu City Hospital, Istanbul, Türkiye

Correspondence: Hüseyin Aykut, huseyin.ayk@gmail.com

Conflicts of interest: None.
DOI: 10.15403/jgld-6036

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