UDRUŽENA POJAVA POLICITEMIJE VERE I MULTIPLOG MIJELOMA: PRIKAZ SLUČAJA

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CASE REPORT

COEXISTENCE OF POLYCYTHEMIA VERA AND MULTIPLE MYELOMA: A CASE REPORT

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SAŽETAK

Uvod: Policitemija vera (PV) je hronična mijeloproliferativna neoplazma koju karakteriše klonalna proliferacija eritrocitne a neretko i mijeloide i megakariocitne loze, najčešće povezana sa pojavom mutacije u JAK2 genu. Multipli mijelom (MM), s druge strane, je maligna neoplazma koju karakteriše klonalna proliferacija plazma ćelija u koštanoj srži i sekrecija monoklonskog imunoglobulina. Koegzistencija policitemije vere i multiplog mijeloma kod istog pacijenta je izuzetno retka, jer ovi poremećaji potiču od različitih hematopoetskih ćelijskih linija.

Prikaz slučaja: Predstavljamo slučaj pacijenta sa dugogodišnjom PV koji je tokom svog kliničkog toka razvio i sekundarni hematološki malignitet MM, ukazujući na izazove tokom dijagnostike i lečenja udružena dva hematološka maligniteta.

Zaključak: Prognoza pacijenata sa udruženim hematološkim malignitetima zavisi od tipa i agresivnosti oboljenja, stadijuma u trenutku otkrivanja i optimalnog terapijskog pristupa. Prikazani slučaj podseća da se klinički znaci i simptomi kod pacijenta sa već postojećom dijagnozom ne smeju tumačiti isključivo u okviru osnovne bolesti. Diferencijalna dijagnoza mora ostati široka, uz pojedinačno ispitivanje svakog novog simptoma, čime se omogućava rano prepoznavanje dodatne patologije i pravovremeno lečenje.

Ključne reči: multipli mijelom, policitemija vera, mijeloproliferativne neoplazme

ABSTRACT

Introduction: Polycythemia vera (PV) is a chronic myeloproliferative neoplasm characterized by the clonal proliferation of erythroid, myeloid, and megakaryocytic lineages, most commonly associated with the JAK2 V617F mutation. Multiple myeloma (MM), on the other hand, is a malignant plasma cell neoplasm characterized by clonal proliferation of plasma cells in the bone marrow and the secretion of monoclonal immunoglobulin. The coexistence of PV and MM in the same patient is extremely rare, as these disorders originate from distinct hematopoietic lineages.

Case report: We report the case of a patient with long-standing PV who subsequently developed MM, highlighting the diagnostic and therapeutic challenges of this unusual association.

Conclusion: The prognosis of patients with concomitant hematologic malignancies depends on the type and aggressiveness of the diseases, the clinical stage at the time of detection, and the adequacy of the therapeutic approach. This case highlights the importance of avoiding automatic attribution of new clinical symptoms to a pre-existing diagnosis. A broad differential diagnosis should always be maintained, with each new symptom evaluated individually, allowing for early recognition of additional hematologic pathology and timely initiation of appropriate treatment.

Keywords: multiple myeloma, polycythemia vera, myeloproliferative neoplasms

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UVOD

Policitemija vera (PV) je mijeloproliferativna neoplazma koju karakteriše klonalna eritrocitoza, dok druge karakteristike uključuju leukocitozu, trombocitozu, splenomegaliju, pruritus, konstitucionalne simptome, poremećaje mikrocirkulacije i povećan rizik od tromboze i progresije u mijelofibrozu (MF nakon PV) ili akutnu mijeloidnu leukemiju (AML) [1]. Više od 95% pacijenata ima mutaciju JAK2 gena, što pomaže u razlikovanju PV od sekundarnih uzroka eritrocitoze [2]. Mutacija JAK2 kinaze dovodi do poremećaja signalizacije koji rezultiraju nekontrolisanom proliferacijom eritroidnih progenitora. Zamena valina fenilalaninom na poziciji 617 JAK2 gena, ili JAK2V617F, uzrokuje konstitutivnu aktivaciju citokinskih receptora, nezavisno od prisustva eritropoetina [3]. Pored JAK2 mutacije, kod manjeg broja pacijenata mogu se javiti mutacije u TET2, DNMT3A i ASXL1 genima, koji doprinose heterogenosti kliničke slike i riziku progresije bolesti [4]. Klinički tok PV je hroničan i sporo progresivan, a glavne komplikacije uključuju tromboembolijske događaje, transformaciju u post-policitemijsku mijelofobrozu i akutnu mijeloidnu leukemiju. Postignut je značajan napredak u razvoju novih terapijskih pristupa za pacijente sa policitemijom verom (PV) [5,3]. Standardni terapijski pristup obuhvata terapijsku venepunkciju i citoreduktivnu terapiju (hidroksiurea) [5].

Multipli mijelom (MM), s druge strane, je maligni poremećaj plazma ćelija koji karakteriše klonska proliferacija plazma ćelija unutar koštane srži, što dovodi do prekomerne proizvodnje monoklonskih imunoglobulina (M- proteina), osteolitičkih lezija, anemije, bubrežne slabosti i imunodeficijencije [6]. Multipli mijelom čini približno 10% hematoloških maligniteta i predstavlja drugi po učestalosti hematološki malignitet posle limfoma [7]. Bolest najčešće pogađa osobe starije od 60 godina i ima značajan uticaj na morbiditet i mortalitet. U patogenezi MM-a ključnu ulogu imaju genetske abnormalnosti, mikrookruženje koštane srži i disregulacija signalnih puteva koji stimulišu preživljavanje i proliferaciju plazma ćelija [8,9].

Policitemija vera i multipli mijelom predstavljaju hronične hematološke maligne bolesti koje potiču iz različitih hematopoteskih loza – mijeloidne i limfoidne, što čini njihovu koegzistenciju kod jednog pacijenta neuobičajenom i zanimljivom kliničkom pojavom. Uprkos različitom poreklu, obe bolesti mogu deliti zajedničke faktore rizika, uključujući izloženost jonizujućem zračenju, hroničnu stimulaciju hematopoetskih ćelija i akumulaciju somatskih mutacija tokom starenja [1,6,10]. Istovremena ili uzastopna pojava PV i MM je retka, sa samo ograničenim brojem slučajeva prijavljenih u literaturi. Precizni mehanizmi koji leže u osnovi

INTRODUCTION

Polycythemia vera (PV) is a myeloproliferative neoplasm distinguished by clonal erythrocytosis. Other features include leukocytosis, thrombocytosis, splenomegaly, pruritus, constitutional symptoms, microcirculatory disturbances, and an increased risk of thrombosis and progression to myelofibrosis (post-PV MF) or acute myeloid leukemia (AML) [1]. Over 95% of patients possess a JAK2 gene mutation, which helps differentiate PV from secondary erythrocytosis causes [2]. Mutations in the JAK2 kinase lead to signaling abnormalities that cause uncontrolled proliferation of erythroid progenitors. The substitution of valine with phenylalanine at position 617 of the JAK2 gene (JAK2V617F) results in constitutive activation of cytokine receptors, regardless of erythropoietin presence [3]. Besides JAK2 mutations, a smaller percentage of patients may have mutations in the TET2, DNMT3A, and ASXL1 genes, contributing to clinical heterogeneity and the risk of disease progression [4]. The clinical course of PV is chronic and slowly progressive, with major complications including thromboembolic events, transformation to post-polycythemic myelofibrosis, and acute myeloid leukemia. Significant progress has been made in developing new therapeutic approaches for patients with polycythemia vera [5,3]. The standard treatment includes therapeutic venesection and cytoreductive therapy (hydroxyurea) [5].

Multiple myeloma (MM), on the other hand, is a malignant plasma cell disorder characterized by clonal proliferation of plasma cells within the bone marrow, leading to excessive production of monoclonal immunoglobulins (M protein), osteolytic lesions, anemia, renal impairment, and immunodeficiency [6]. Multiple myeloma accounts for approximately 10% of hematologic malignancies and represents the second most common hematologic malignancy after lymphoma [7]. The disease most commonly affects individuals older than 60 years and has a significant impact on morbidity and mortality. Genetic abnormalities, the bone marrow microenvironment, and dysregulation of signaling pathways that stimulate plasma cell survival and proliferation play a crucial role in the pathogenesis of MM [8,9].

Polycythemia vera and multiple myeloma are chronic hematologic malignancies originating from different hematopoietic lineages–myeloid and lymphoid–which makes their coexistence in a single patient an unusual and clinically intriguing phenomenon. Despite their different origins, both diseases may share common risk factors, including exposure to ionizing radiation, chronic stimulation of hematopoietic cells, and accumulation of somatic mutations during aging [1,6,10]. The simultaneous or sequential occurrence of PV and MM is rare, with

ove povezanosti ostaju nejasni [10]. Ovaj izveštaj predstavlja redak slučaj pacijenta kome je inicijalno dijagnostikovana policitemija vera, a koji je kasnije razvio multipli mijelom.

Cilj nam je da doprinesemo literaturi o ovoj neobičnoj koegzistenciji i da diskutujemo o mogućim patogenetskim mehanizmima i kliničkim implikacijama.

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Kod pacijenta starosti 54 godine postavljena je dijagnoza policitemije vere tokom 2010. godine, a nakon hematološke obrade koja je uključivala i biopsiju koštane srži. Od momenta postavljanja dijagnoze njegov tretman je uključivao acetilsalicilnu kiselinu (ASA) sa povremenom terapijskom flebotomijom koja se izvodi po potrebi radi kontrole nivoa hematokrita. Nakon 5 godina u terapiju uvedena i hidroksiureja (Litalir®). Bolest je ostala klinički stabilna 15 godina, uz redovno hematološko praćenje, a pacijent je bio bez tegoba. U ličnoj anamnezi: boluje od hipertenzije, i daje podatak da se ranije lečio od multiple skleroze, ali da je bolest u remisiji i da nema nikakvu terapiju, osim redovnih kontrola neurologa. U julu tekuće godine na jednoj od redovnih kontrola pacijent prijavljuje da je primetio krv u stolici (tada vrednost Hgb u krvnoj slici 120 g/l); nakon čega je upućen gastroenterologu i sprovedena je kompletna obrada. Od strane gastroenterologa potvrđeni su hemoroidi. Nakon mesec dana, na redovnoj kontroli registruje pad hemoglobina na 80 g/l, kao i abnormalnosti u rezultatima imunologije (IgG: 158,29 g/L, IgM: 0,22 g/L, C3:0,08 g/L, C4:0,03 g/L), ali i hiperproteinemija uz očuvanu bubrežnu funkciju. Pacijent se žali na opštu slabost i malaksalost, kao i na gubitak u telesnoj težini. Indikovana je hitna hospitalizacija radi evaluacije u pravcu multiplog mijeloma i daljeg lečenja. Pri prijemu, pacijent je bio afebrilan i hemodinamski stabilan. Tokom hospitalizacije sprovedena je dalja dijagnostika. U aspiratu koštane srži registrovano je 8–10% plazma ćelija. Testiranje fluorescentnom in situ hibridizacijom (FISH) bilo je negativno na citogenetske abnormalnosti ili mutacije visokog rizika. Elektroforezom seruma i urina dokazano je prisustvo M komponente u klasi IgG (kappa laki lanci). Urađen je niskodozni skener skeleta koji je pokazao višestruke osteolitičke lezije koje zahvataju aksijalni i apendikularni skelet. U bioptatu koštane srži, imunohistohemijski je dobijen sledeći fenotip: CD71+, MPO+, CD61+, CD34+ (< 5%), CD117+ (< 5%), CD56+ (35%), uz jasnu restrikciju kappa lakih lanaca 5:1. U zaključku takođe potvrđeno da je reč o istovremenom prisustvu policitemije vere i multiplog mijeloma. Tokom hospitalizacije, pacijent je podvrgnut terapijskoj plazmaferezi radi kontrole hiperproteinemije. Nakon

only a limited number of cases reported in the literature. The exact mechanisms underlying this association remain unclear [10]. This report presents a rare case of a patient initially diagnosed with polycythemia vera who subsequently developed multiple myeloma.

Our aim is to contribute to the literature on this unusual coexistence and to discuss possible pathogenetic mechanisms and clinical implications.

CASE REPORT

A 54-year-old patient was diagnosed with polycythemia vera in 2010 after a hematologic evaluation that included a bone marrow biopsy. Since diagnosis, treatment involved acetylsalicylic acid (ASA) with occasional therapeutic phlebotomy as needed to manage hematocrit levels. After five years, hydroxyurea (Litalir®) was added to the treatment plan. The disease remained clinically stable for 15 years with regular hematologic follow-up, and the patient was asymptomatic. Past medical history included arterial hypertension and multiple sclerosis, which was reported to be in remission, with no ongoing therapy besides regular neurological follow-up. In July of this year, during a routine follow-up visit, the patient reported noticing blood in the stool (hemoglobin level at that time was 120 g/L). He was referred to a gastroenterologist, and a complete diagnostic workup was performed, confirming hemorrhoids. One month later, during a scheduled follow-up, a further drop in hemoglobin to 80 g/L was observed, along with abnormalities in immunological parameters (IgG: 158.29 g/L, IgM: 0.22 g/L, C3: 0.08 g/L, C4: 0.03 g/L), as well as hyperproteinemia with preserved renal function. The patient reported general weakness, fatigue, and weight loss. Urgent hospitalization was recommended for evaluation of multiple myeloma and further management. Upon admission, the patient was afebrile and hemodynamically stable. Further diagnostic procedures were carried out during hospitalization. Bone marrow aspirate showed 8–10% plasma cells. Fluorescence in situ hybridization (FISH) testing was negative for cytogenetic abnormalities or high-risk mutations. Serum and urine protein electrophoresis revealed the presence of an M component in the IgG class (kappa light chains). Low-dose skeletal computed tomography identified multiple osteolytic lesions involving both the axial and appendicular skeleton. Immunohistochemical analysis of the bone marrow biopsy showed the following phenotype: CD71+, MPO+, CD61+, CD34+ (<5%), CD117+ (<5%), CD56+ (35%), with a clear kappa light chain restriction at a ratio of 5:1. The conclusion confirmed the simultaneous presence of polycythemia vera and multiple myeloma. During hospitalization, the patient received therapeu-

toga, započeta je hemoterapija prema VTD protokolu (bortezomib, talidomid, deksametazon). Pacijent trenutno prima četvrti ciklus terapije, nakon čega će se proceniti odgovor na lečenje i status bolesti.

DISKUSIJA

Istovremena pojava policitemije vere i multiplog mijeloma je izuzetno retka i predstavlja značajne dijagnostičke i terapijske izazove. PV nastaje iz klona mijeloidnih matičnih ćelija i u većini slučajeva je uzrokovana mutacijom JAK2 V617F, dok MM predstavlja neoplazmu limfocita- plazma ćelija [3,5]. Koegzistenciju multiplog mijeloma i policitemije vere prvi su opisali Lorens i Rozental 1948. godine [7,8]. Opisani su slučaji poput našeg pacijenta gde je inicijalno postavljena dijagnoza policitemije, a zatim multiplog mijeloma, ali i slučajevi gde je redosled bolesti drugačiji, odnosno prvo MM, a zatim PV [8,11]. Takođe je opisan slučaj pacijentkinje kod koje je istovremeno postavljena dijagnoza PV i monoklonske gamapatije (MGUS) koja je kasnije progredirala u klinički manifestni multipli mijelom [11]. Pacijenti su lečeni primenom HU, koja je obustavljena nakon dijganoze MM [9,11,12]. Lečenje mutiplog mijeloma sprovedeno je primenom VCD (bortezomib + ciklofosfamid + dexametazon) protokola kao prve terapijske linije [9–12]. U trenutku kada su ovi prikazi slučajeva objavljeni za dva pacijenta je učinjena procena terapijskog odgovora, i oni su bili u parcijalnoj remisiji [9,10]. U tabeli 1 su prikazane karakteristike pacijenata kod kojih su dijagnostikovane ove dve maligne hematološke bolesti. Zanimljivo je da su u pitanju 4 žene, prosečne starosti 70,75 godina [9–12].

Istovremeno postojanje ove dve bolesti kod jednog pacijenta sugeriše ili razvoj dva nezavisna klona ili transformaciju zajedničke progenitorske ćelije sa multipotentnim potencijalom [9]. Predloženo je nekoliko mehanizama za objašnjenje ovog fenomena. Neki autori smatraju da oba poremećaja mogu nastati iz zajedničke pluripotentne hematopoetske matične ćelije sposobne da se diferencira i u mijeloidnu i

tic plasmapheresis to manage hyperproteinemia. Following this, chemotherapy was started using the VTD protocol (bortezomib, thalidomide, dexamethasone). The patient is now on the fourth cycle of treatment, and the response to therapy and disease status will be assessed afterward.

DISCUSSION

The simultaneous occurrence of polycythemia vera and multiple myeloma is extremely rare and represents a significant diagnostic and therapeutic challenge. PV arises from a clone of myeloid stem cells and in most cases is caused by the JAK2 V617F mutation, whereas MM is a neoplasm of lymphocytes–plasma cells [3,5]. The coexistence of multiple myeloma and polycythemia vera was first described by Lawrence and Rosenthal in 1948 [7,8]. Similar cases to our patient have been reported, where the initial diagnosis was polycythemia followed by multiple myeloma, as well as cases where the disease sequence was reversed, with MM preceding PV [8,11]. A case has also been documented of a female patient in whom PV and monoclonal gammopathy of undetermined significance (MGUS) were diagnosed simultaneously, later progressing to clinically evident multiple myeloma [11]. Patients were treated with hydroxyurea (HU), which was discontinued after diagnosing MM [9,11,12]. The treatment for multiple myeloma involved the VCD protocol (bortezomib + cyclophosphamide + dexamethasone) as the initial therapy [9–12]. At the time these case reports were published, treatment response had been evaluated in two patients, both of whom were in partial remission [9,10]. Table 1 presents the characteristics of patients diagnosed with these two malignant hematological diseases. Interestingly, all 4 reported patients were women, with a mean age of 70.75 years [9–12].

The simultaneous presence of these two diseases in a single patient suggests either the development of two independent clones or the transformation of a common progenitor cell with multipotent potential [9].

Tabela 1. Karakteristike pacijenata lečenih od MM i PV – podaci iz dosadašnje literature

Table 1. Characteristics of patients treated for MM and PV – data from the existing literature

Pol / *Gender*	Starost / *Age*	Dg MM u odnosu na PV / *Dg MM in relation to PV*	Th PV / *Th PV*	Th MM / *Th MM*	Th odgovor / *Th response*
Ženski / *Female*	81	Nakon 5 god / *After 5 years*	HU	VCD	PR nakon 9 cy / PR after 9 cy
Ženski / *Female*	70	Istovremeno / *At the same time*	Bez th / Without th	VCD	PR, bez podataka o broju cy / PR, without data on the number of cy
Ženski / *Female*	65	Nakon 5 god / *After 5 years*	venepunkcije / Venipuncture	VCD	bez podataka / Without data
Ženski / *Female*	67	Nakon 13 god / *After 13 years*	HU	VCD	Primila 1 cy / Received 1 cy

u limfoidnu lozu [7]. Drugi predlažu da koegzistencija može biti slučajna ili moguće povezana sa terapijom, posebno kod pacijenata lečenih citoreduktivnim agensima kao što je hidroksiureja [8]. U kliničkoj praksi, važno je razmotriti potencijalnu ulogu prethodne terapije citoreduktivnim lekovima, koja može delovati kao dodatni genotoksični stresori podstaći klonalnu evoluciju [13]. Sugerisano je da hronična stimulacija koštane srži, aktivacija inflamatornih citokina i izmenjeno mikrookruženje koštane srži kod PV mogu doprineti sekundarnoj klonalnoj evoluciji i proliferaciji plazma ćelija [9]. U novijim istraživanjima sugeriše se mogućnost da hronična stimulacija hematopoetskih progenitora u uslovima povećane proliferativne aktivnosti kod PV može stvoriti mikrookruženje pogodno za nastanak sekundarnih klonalnih poremećaja, uključujući plazmocitne diskrazije [11,12]. Takođe, produžena izloženost citokinima kao što su IL-6 i TNF-alfa može doprineti aktivaciji signalnih puteva koji podstiču proliferaciju plazma ćelija. Klinički, rano prepoznavanje multiplog mijeloma kod pacijenata sa PV može biti teško, jer simptomi poput umora ili laboratorijskih abnormalnosti, kao što su povišeni nivoi proteina, u početku mogu biti pripisani primarnom mijeloproliferativnom poremećaju [7,8]. Sa dijagnostičkog aspekta, kod pacijenta sa poznatom PV, pojava hipergamaglobulinemije, bubrežne disfunkcije ili anemije koja nije u skladu sa osnovnim tokom bolesti treba da pobudi sumnju na moguću pojavu multiplog mijeloma [11,13]. Rano prepoznavanje ove asocijacije omogućava pravovremeno sprovođenje ciljne terapije i bolju kontrolu komplikacija. Sa terapijskog aspekta, neophodno je pažljivo balansirati između tretmana usmerenih na kontrolu eritrocitoze i onih koji ciljaju plazmocitnu proliferaciju, imajući u vidu moguću toksičnost i interakcije lekova [13].

Ovaj prikaz slučaja dodatno naglašava potrebu za dugoročnim praćenjem pacijenata sa mijeloproliferativnim neoplazmama, budući da klonalna evolucija može rezultirati pojavom sekundarnih maligniteta. U tom kontekstu, integracija molekularne dijagnostike, kao što su analiza JAK2 mutacije i detekcija monoklonalnog paraproteina, ima ključnu ulogu u ranoj dijagnostici i praćenju bolesti [10–12].

U našem slučaju, pojava novog kliničkog znaka, odnosno krvarenja u stolici, pokrenula je dodatna ispitivanja koja su uključivala i rutinsko biohemijsko praćenje, a koje je bilo ključno u otkrivanju hiperproteinemije, što je dovelo do blagovremene dijagnostičke evaluacije i identifikacije multiplog mijeloma. Lečenje takvih slučajeva zahteva individualizovan, multidisciplinarni pristup. Zbog retkosti ove dvostruke dijagnoze, optimalne strategije lečenja i dugoročni ishodi nisu

Several mechanisms have been proposed to explain this phenomenon. Some authors suggest that both disorders may originate from a common pluripotent hematopoietic stem cell capable of differentiating into both myeloid and lymphoid lineages [7]. Others propose that the coexistence may be coincidental or possibly related to therapy, particularly in patients treated with cytoreductive agents such as hydroxyurea [8]. In clinical practice, it is important to consider the potential role of prior cytoreductive therapy, which may act as an additional genotoxic stressor and promote clonal evolution [13]. It has been suggested that chronic bone marrow stimulation, activation of inflammatory cytokines, and an altered bone marrow microenvironment in PV may contribute to secondary clonal evolution and plasma cell proliferation [9]. More recent studies suggest that chronic stimulation of hematopoietic progenitors, driven by increased proliferative activity in PV, may create a microenvironment conducive to the development of secondary clonal disorders, including plasma cell dyscrasias [11,12]. In addition, prolonged exposure to cytokines such as IL-6 and TNF-α may contribute to the activation of signaling pathways that promote plasma cell proliferation. Clinically, early detection of multiple myeloma in patients with PV can be difficult because symptoms like fatigue or lab abnormalities, such as elevated protein levels, might initially be mistaken for the underlying myeloproliferative disorder [7,8]. From a diagnostic point of view, in a patient with known PV, the presence of hypergammaglobulinemia, renal dysfunction, or anemia that do not align with the expected disease course should raise suspicion of developing multiple myeloma [11,13]. Recognizing this association early allows for timely targeted therapy and improved management of complications. From a treatment perspective, it is crucial to carefully balance therapies aimed at controlling erythrocytosis with those targeting plasma cell proliferation, considering potential toxicity and drug interactions [13].

This case report further highlights the importance of long-term follow-up for patients with myeloproliferative neoplasms, as clonal evolution can lead to the development of secondary malignancies. In this context, incorporating molecular diagnostics, such as JAK2 mutation analysis and detection of monoclonal paraprotein, is essential for early diagnosis and ongoing disease monitoring [10–12].

In our case, the appearance of a new clinical sign-specifically, gastrointestinal bleeding–prompted additional investigations, including routine biochemical monitoring, which was crucial in detecting hyperproteinemia and led to timely diagnostic evaluation and the identification of multiple myeloma. Managing

precizno utvrđeni, a većina dokaza dolazi iz izolovanih izveštaja o slučajevima. Ovaj slučaj predstavlja neuobičajenu koegzistenciju policitemije vere i multiplog mijeloma, dva različita klonalna hematološka poremećaja sa različitim patofiziološkim poreklom.

ZAKLJUČAK

Ovaj slučaj doprinosi ograničenom broju izveštaja koji opisuju udruženu pojavu policitemije vere i multiplog mijeloma, naglašavajući potrebu za budnim dugoročnim praćenjem i sveobuhvatnom evaluacijom novih i neočekivanih znakova i simptoma, kao i hematoloških ili biohemijskih abnormalnosti kod pacijenata sa hroničnim mijeloproliferativnim neoplazmama. Rano prepoznavanje i odgovarajuća terapijska intervencija mogu poboljšati kliničke ishode i kvalitet života kod ovih kompleksnih pacijenata.

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such cases requires an individualized, multidisciplinary approach. Due to the rarity of this dual diagnosis, optimal treatment strategies and long-term outcomes have not been clearly established, and most evidence comes from isolated case reports. This case illustrates an unusual coexistence of polycythemia vera and multiple myeloma, two distinct clonal hematological disorders with different pathophysiological origins.

CONCLUSION

This case contributes to the small number of reports documenting the coexistence of polycythemia vera and multiple myeloma. It emphasizes the importance of vigilant long-term follow-up and thorough evaluation of new and unexpected signs, symptoms, and hematological or biochemical abnormalities in patients with chronic myeloproliferative neoplasms. Early recognition and timely treatment may enhance clinical outcomes and improve quality of life for these complex patients.

Conflict of interest: None declared.

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