(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume3, Issue 6, Page No: 756-763
November-December 2020

IJMSCR

Diagnostic value of bone marrow examination in Immune Thrombocytopenic Purpura

Dr. Poonam Nanwani, Dr.Smita Doharey, Dr. Meena Singrol, Dr. Ashok Panchonia, Dr. Sativan Khatri
Department of pathology, MGM Medical College Indore Madhya Pradesh and M.Y. Hospital, Indore

***Corresponding Author:**
Dr. Poonam Nanwani
Department of pathology, MGM Medical College Indore Madhya Pradesh and M.Y. Hospital, Indore

Type of Publication: Original Research Paper
Conflicts of Interest: Nil

ABSTRACT

Immune thrombocytopenic purpura is characterized by immune mediated accelerated platelet destruction that will lead to suppressed platelet production.[1] The incidence of Immune thrombocytopenic purpura is 50-100 new cases per million per year in which children accounting for half of the cases. The male to female ratio in the adult group varies from 1:1.2 to 1.7 and median age of adults at the time of diagnosis is 56 to 60 year.[2] .It presents as primary or as secondary . In immune thrombocytopenic purpura primary there are no other causes are identified and in secondary immune thrombocytopenic purpura the underlying conditions exist may be autoimmune or non immune.[3] Diagnosis of immune thrombocytopenic purpura made on the basis of clinical features and normal peripheral smear. Examination of bone marrow is not diagnostic of immune thrombocytopenic purpura, rather it helps in ruling out other causes of thrombocytopenia like myelodysplastic syndrome or aplastic anemia.[4] It can occur at all ages, in acute and chronic forms. Children mainly have acute form,which usually follows a recent viral infection,occurs equally in both sexes, and generally resolve within 6 months.[5] While chronic immune thrombocytopenic purpura occurs in adults, and has an insidious onset, and shows female preponderance.[6]Classic treatment with corticosteroids and splencectomy is highly successful in most cases.[7]

MATERIAL AND METHOD: This prospective study was conducted on 50 patients of immune thrombocytopenic purpura at department of pathology, MGM medical college and M.Y. Hospital,Indore.We have collected hemogram ,peripheral smear and bone marrow aspiration of all the cases.

RESULTS: In our study majority of cases belong to the age <20years with female preponderance. Petechiae and was the most common clinical presentation and other hematopoietic finding was normal. Bone marrow examination was normocellular with normal or increased megakaryocytes. Majority of cases show show increased number of megakaryocytes having hyper and hypolobated form along with hypo and hypergranulated megakaryocytes.

CONCLUSION: Our study is done to assess the diagnostic value of bone marrow examination in immune thrombocytopenic purpura. It is necessary to study the megakaryopoiesis and changes in megakaryopoiesis in immune thrombocytopenic purpura like megakaryocytes are young, immature and less polyploid and fewer mature megakaryocytes is very common.

Keywords: Immune thrombocytopenic purpura,Bone marrow examination, Megakaryocyte morphology

INTRODUCTION

Immune thrombocytopenic purpura is immune mediated disorder of platelets described as isolated thrombocytopenia with normal bone marrow and the absence of other causes of thrombocytopenia. It is immune mediated process characterized by accelerated platelet destruction and suppressed platelet production. In immune thrombocytopenic purpura autoantibodies directed against the surface

glycoprotein 1b/1X or 2b/3a in nearly two third of cases, antiplatelet antibodies also bind to megakaryocytes affecting platelet production. Diagnosis is based on clinical symptoms and peripheral smear finding except for thrombocytopenia. In Immune thrombocytopenic pupura bone marrow examination is done to rule out leukemia,myelodysplastic syndrome or aplastic anemia. The bone marrow examination is widely accepted investigation in adults with immune thrombocytopenic purpura, immune thrombocytopenic purpura is done to exclude hypomegakaryocytic thrombocytopenic conditions, such as acute leukemia or aplastic anemia. Thrombocytopenia in patients of leukemia or aplastic anemia is always associated with some other hematologic sign such as anemia,splenomegaly, neutropenia ,reticulocytopenia or an abnormal peripheral smear. Immunethrombocytopenia is a diagnosis of exclusion. Immune thrombocytopenic purpura in children manifests as isolated thrombocytopenia ,purpura and petechiae. Immune thrombocytopenic purpura is the one of the most common causes of thrombocytopenia in pediatric patient.

The acute form of the disease is more common and occur in 70-80% of cases, and it is cured in less than 6 months, while 20-30% cases convert to chronic form. In immune thrombocytopenic purpura, the bone marrow aspirates is normocellular with increased or normal numbers of megakarocytes and unremarkable erythropoiesis and granulopoiesis. Immature megakaryocytes with hypolobated nuclei are tyical of immune thrombocytopenic purpura, although dysplastic megakaryocytes, naked megakaryocyte nuclei and to a lesser degree micromegakaryocytes are also found in immune thrombocytopenic purpura bone marrow aspirates.

AIMS AND OBJECTIVE: the aim to assess the hematological features associated with immunethrombocytopenia in bone marrow aspirates. Evaluation of clinical , biochemical and bone marrow studies to differentiate immune thrombocytopenic purpura from other causes of thrombocytopenia.

MATERIAL AND METHOD:

We have conducted a 02 year study , from 2018 to 2020. This is prospective study done in the department of pathology, Mahatama Gandhi medical college, Indore. We studied bone marrow aspirates of Immune thrombocytopenic purpura who presented to our hospital from 2018-2020 a record of examination of the patient and detailed history was collected . After obtaining informed consent bone marrow aspiration was done. Bone marrow aspiration was evaluated for adequacy, cellularity, morphology and maturation of hematopoietic precursor cell.

Study design: Prospective study

Study center: Department of pathology, MGM Medical College Indore Madhya Pradesh and M.Y. Hospital, Indore.

Duration of study: 2 years (2018-2020)

Sample size: 50

Inclusion criteria: All the cases of thrombocytopenia with clinical features of immune thrombocytopenic purpura.

Exclusion criteria: All the diluted marrows and cases of thrombocytopenia without the clinical features of immune thrombocytopenic purpura.

REULTS AND OBSERVATION

All cases had undergone a bone marrow examination.Out of 50 cases, 31 (62 %) were females. Based on age, cases were categorized into six groups as shown in the Table1.

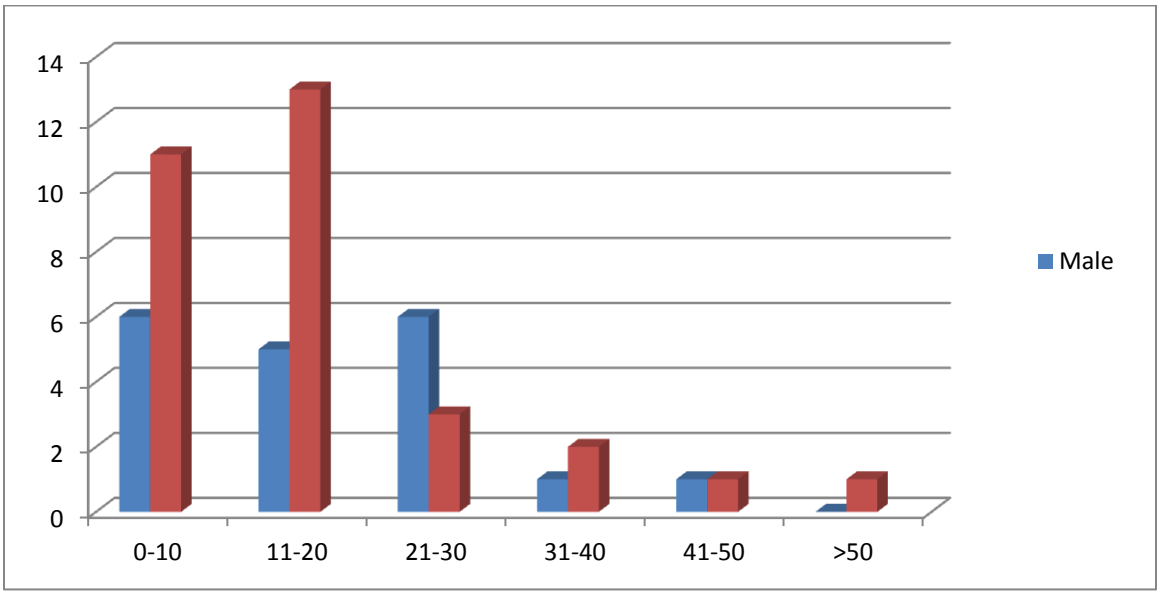
Table 1-Agewise distribution

AGE (In Years)	**NO. of patient**	**PERCENTAGE**
0-10	18	36%
11-20	18	36%

Volume 3, Issue 6; November-December 2020; Page No 756-763

21-30	09	18%
31-40	02	04%
41-50	02	04%
>50	01	02%

RELATIONSHIP OF GENDER WITH IMMUNE THROMBOCYTOPENIC PURPURA:



CLINICAL SPECTRUM OF ITP IN STUDY GROUP:

Petechiae

Gingival bleeding and epistaxix

Menorrhagia

Malena or gastrointestinal bleeding

Intracranial bleeding

Hematuria

Generalized weakness and massive splenomegaly

Table 2

Presentation of Immune thrombocytopenic purpura cases-

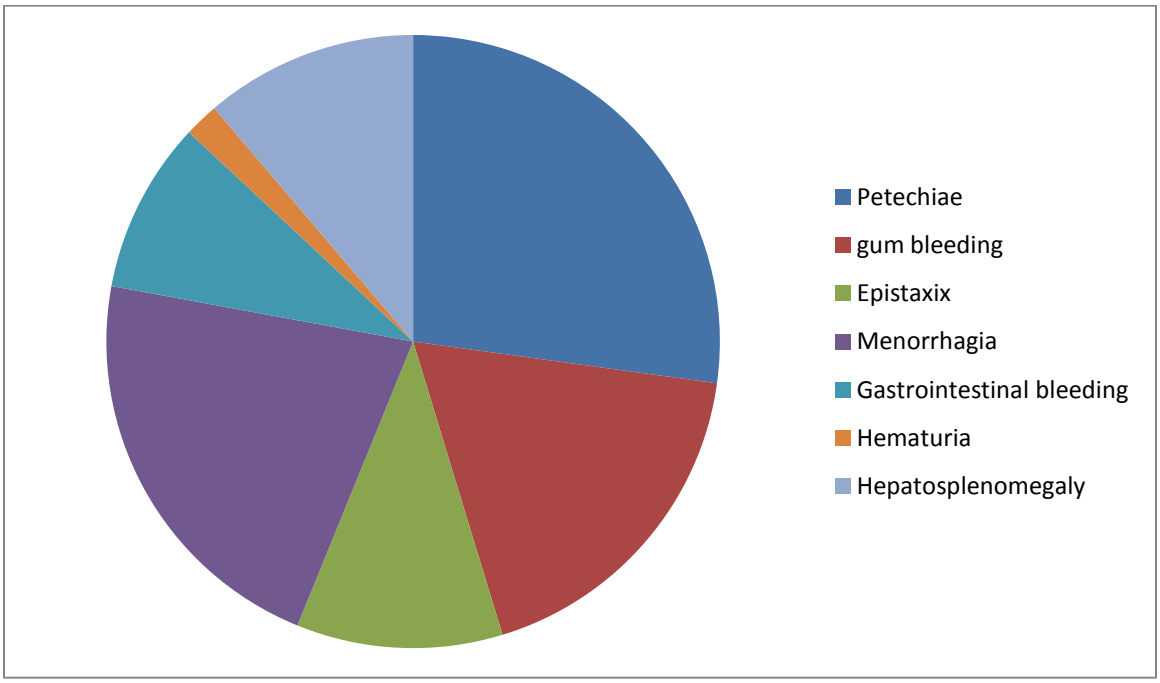
Clinical symptom and relative frequency-

Petechiae	75%
Epistaxis	30%
Gum bleeding	50%
Menorrhagia	60%
Hematuria	5%

Volume 3, Issue 6; November-December 2020; Page No 756-763

Gastrointestinal bleeding	25%

There is also history of hepatosplenomegaly in 30% of cases at the time of presentation.



DISCUSSION: Immune thrombocytopenic purpura is characterized by immune mediated accelerated platelet destruction resulting in thrombocytopenia and megakaryocyte changes in the bone marrow .Bone marrow aspiration finding in immune thrombocytopenic purpura are megakaryocytes are young, immature and less polyploid and fewer mature megakaryocytes is very common. Dysplastic forms along with bare forms and micro-megakaryocytic forms are seen in most of the cases. Clinical history and general physical examination along with a peripheral blood smear examination play important role in diagnosis of immune thrombocytopenic purpura .

In our study no diagnosis of leukemia were revealed in 50 patients with typical hematological features of immune thrombocytopenic purpura. In a study of Caroline C et al [8] retrospective study on 322 children with hematologic features consistent of Immune thrombocytopenic purpura, concluded that the risk of missing the diagnosis of leukemia was not greater than 1 % and study of Westerman et al.,[9] done on adults less than 65 years age noted 5 patients (of 66), who had atypical marrow picture initially but on follow-up did not develop any features to suggest an alternative diagnosis such as leukemia, myelodysplasia, or aplastic anemia. In a study of Klaassen RJ et al [10] a decision tree was constructed for the initial management of a child more than 6 months, of age presenting with idiopathic thrombocytopenia, without blasts on the peripheral smear examination. They studied three strategies: (A) initial BMA in all patients; (B) initial BMA only in patients at high risk; and (C) empiric therapy for all patients without initial BMA and the results of these were expressed as quality-adjusted life years. QALYs- It is a measure that estimates the overall life expectancy in years for patients receiving a particular treatment strategy, corrected for the patient's quality of life. Finally Conclusion was made that the initial bone marrow aspiration examination did not significantly change the overall quality adjusted life years of a child presenting with thrombocytopenia and, consequently, it is not compulsory in every patient before starting steroids .

Mahabir et al[11] in their study on 32 adult immune thrombocytopenic purpura patients and 51 controls, concluded that overall sensitivity and specificity of bone marrow examinations were 24 and 90 %, respectively. Conversely, in a retrospective data on

Volume 3, Issue 6; November-December 2020; Page No 756-763

2239 children with acute and described splenomegaly in as many as 48 out of 72 immune thrombocytopenic purpura patients, while Hijazi et al. described it in 31/56 Arab children.

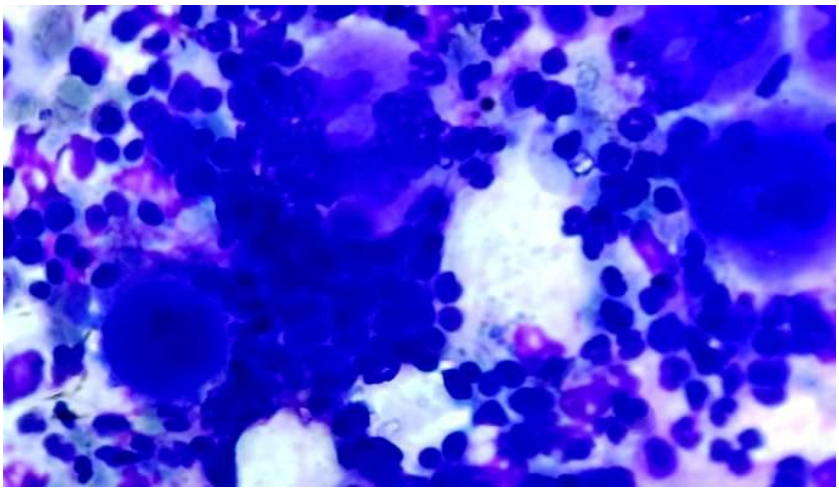


FIGURE.1 :Increase number of megakaryocytes having hyper and hypolobated form(100x)

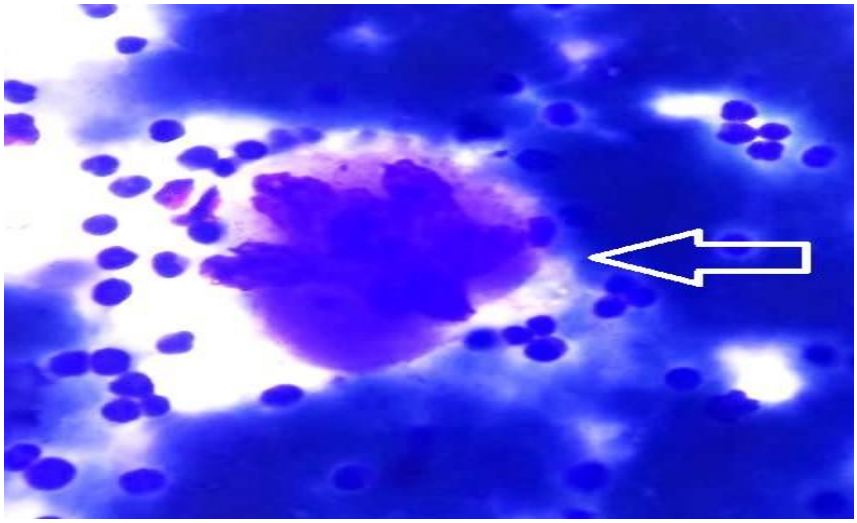


Figure 2.Hyperlobated form of megakaryocytes(100x)

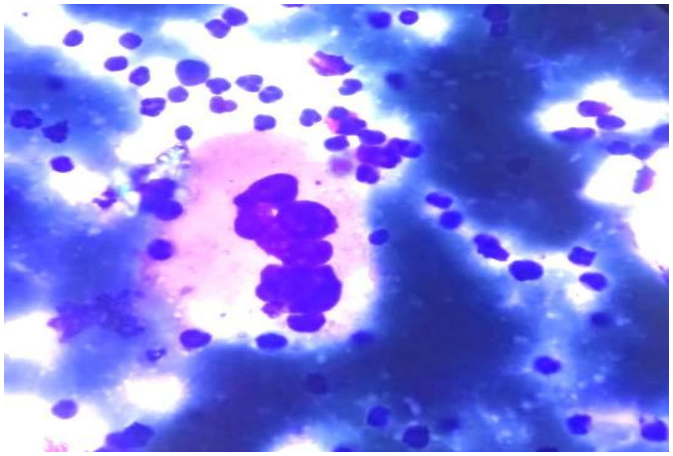


Figure 3a.

Volume 3, Issue 6; November-December 2020; Page No 756-763

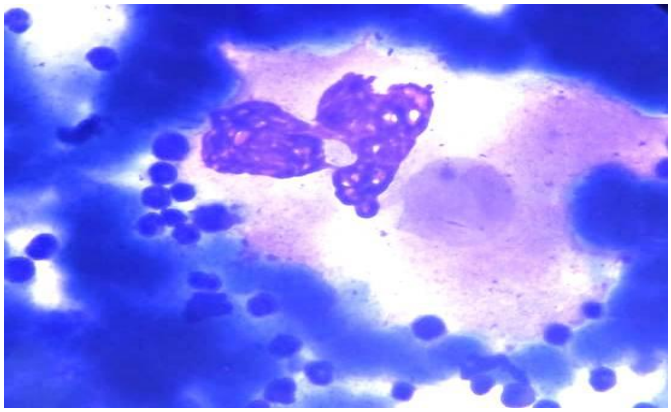


Figure 3b.

Figure 3a & 3b-Hyperlobated and hypogranular megakaryocytes of different size with hypogranulation respectively

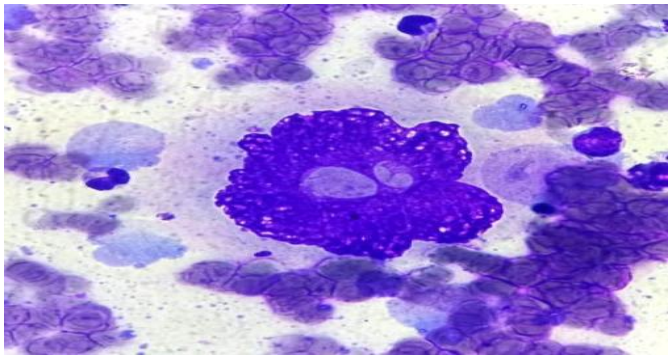


Figure 4.Megakaryocytes forming ring form of nucleus

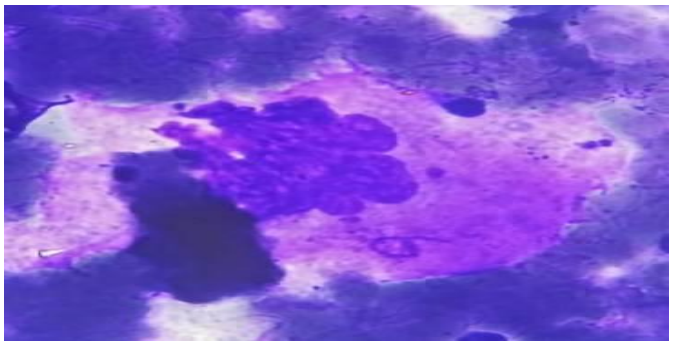


Figure 5.Megakaryocytes showing hyperlobation with hypergranulation

Volume 3, Issue 6; November-December 2020; Page No 756-763

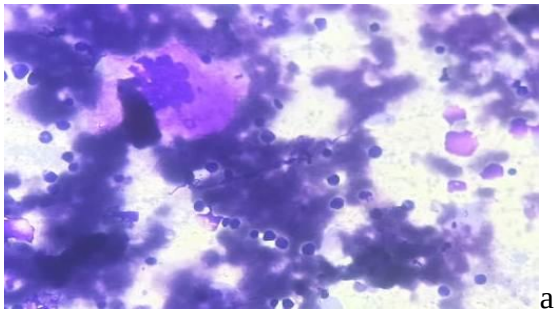
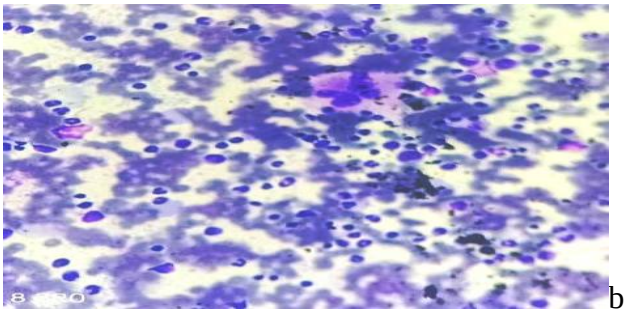
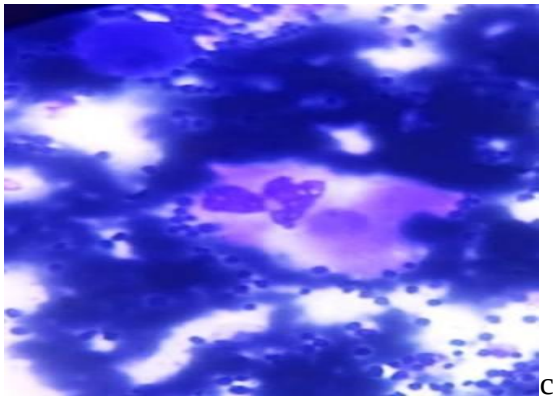
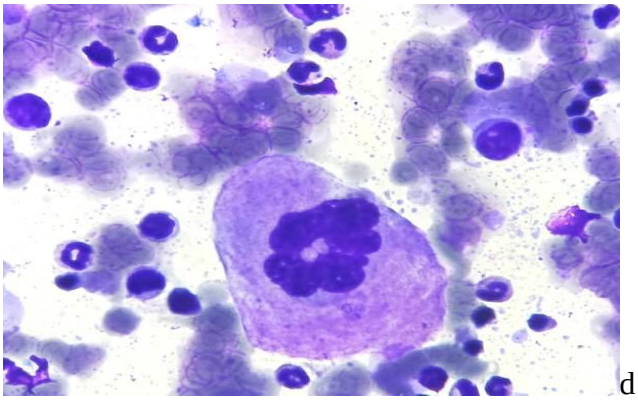

a

b

c

d

Figure 6a,b,c,d –Normocellular marrow show dysmegakaryopoiesis

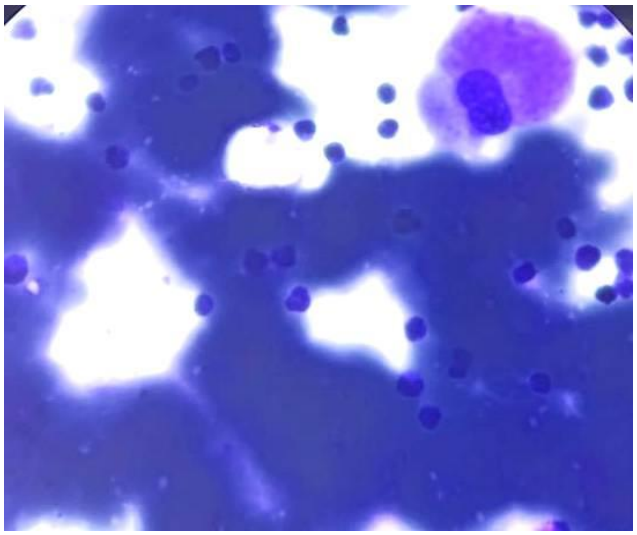


Figure7-Hypolobate dwarf megakaryocytes

CONCLUSION-

Our study is done to assess the diagnostic value of bone marrow examination in immune thrombocytopenic purpura. It is necessary to study the megakaryopoiesis and changes in megakaryopoiesis in immune thrombocytopenic purpura like megakaryocytes are young, immature and less polyploid and fewer mature megakaryocytes is very common. Dysplastic forms along with bare forms and micro-megakaryocytic forms are seen in most of the cases

REFERENCES:

1. Indian J Hematol Blood Transfus. 2016 Jun; 32(2): 193–196.

Volume 3, Issue 6; November-December 2020; Page No 756-763

2. Published online 2015 Mar 28. doi: 10.1007/s12288-015-0533-2 PMCID: PMC4788996 PMID: 27065582
3. https://en.m.wikipedia.org/wiki/Immune_thrombocytopenic_purpura
4. file:///C:/Users/HP/Downloads/report-bone-marrow-aspirate-1410-en%20(4).pdf.
5. Indian J Hematol Blood Transfus. 2016 Jun; 32(2): 193–196. Published online 2015 Mar 28. doi: 10.1007/s12288-015-0533-2 PMCID: PMC4788996 PMID: 27065582
6. file:///C:/Users/HP/Downloads/report-bone-marrow-aspirate-1410-en%20(4).pdf.
7. Eghbali A, Email:aziz_eghbali@yahoo.com Eghbali A1*, Arzaninan M2, Chehrei A3 , Jadidi R4, Sabbagh A5
8. https://www.amjmed.com/article/0002-9343(83)90881-1/pdf:https://doi.org/10.1016/0002-9343(83)90881-1PlumX Metrics VOLUME 75, ISSUE
9. Calpin C, Dick P, Poon A, Feldman W. Is bone marrow aspiration needed in acute childhood idiopathic thrombocytopenic purpura to rule out leukemia? Arch Pediatr Adolesc Med. 1998;152(4):345–347. [PubMed] [Google Scholar]
10. Westerman DA, Grigg AP. The diagnosis of idiopathic thrombocytopenia purpura in adults: does bone marrow biopsy have a place? Med J Aust. 1999;170:216. [PubMed] [Google Scholar]
11. Klaassen RJ, Doyle JJ, Krahn MD, Blanchette VS, Naglie G. Initial bone marrow aspiration in childhood idiopathic thrombocytopenia: decision analysis. J Pediatr Hematol Oncol. 2001;23(8):511–518. doi: 10.1097/00043426-200111000-00009. [PubMed] [CrossRef] [Google Scholar]
12. Mahabir VK, Ross C, Popovic S, Sur ML, Bourgeois J, Lim W, George JN, Wang G, Cook RJ, Toltl LJ, Nazi I, Kelton JG, Arnold DM. A blinded study of bone marrow examinations in patients with primary immune thrombocytopenia. Eur J Haematol. 2013;90:121–126. doi: 10.1111/ejh.12041. [PMC free article] [PubMed] [CrossRef] [Google Scholar].

Volume 3, Issue 6; November-December 2020; Page No 756-763