Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 14s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Glanzmann Thrombasthenia- A Case Report of a Rare Congenital Bleeding Disorder

Dr. Sarnya Verma[1], Dr. Sanjay Chavan[2], Dr. Sarita Varma[3], Dr. Suresha*[4], Dr. Shailaja Mane[5]

[1]Department of Pediatrics, Dr. D. Y. Patil Medical College, Hospital & Research Centre, Dr. D. Y. Patil Vidyapeeth (Deemed to be University), Pimpri Pune-411018 India

[2]Professor, Department of Pediatrics, Dr. D. Y. Patil Medical College, Hospital & Research Centre, Dr. D. Y. Patil Vidyapeeth (Deemed to be University), Pimpri Pune-411018 India

[3]Pediatric Oncology, KEM Hospital Research Centre, Pune, IND

[4*]Department of Pediatrics, Dr. D. Y. Patil Medical College, Hospital & Research Centre, Dr. D. Y. Patil Vidyapeeth (Deemed to be University), Pimpri Pune-411018 India

[5]Professor and HOD, Department of Pediatrics, Dr. D. Y. Patil Medical College, Hospital & Research Centre, Dr. D. Y. Patil Vidyapeeth (Deemed to be University), Pimpri Pune-411018 India

Corresponding Author:

Dr. Suresha

Department of Pediatrics, Dr. D. Y. Patil Medical College, Hospital & Research Centre, Dr. D. Y. Patil Vidyapeeth (Deemed to be University), Pimpri Pune-411018 India

Email ID: Sureshld000@gmail.com

Cite this paper as: Dr. Sarnya Verma, Dr. Sanjay Chavan, Dr. Sarita Varma, Dr. Suresha, Dr. Shailaja Mane, (2025) Glanzmann Thrombasthenia- A Case Report of a Rare Congenital Bleeding Disorder. *Journal of Neonatal Surgery*, 14 (14s), 408-411.

ABSTRACT

Glanzmann Thrombasthenia, a rare inherited bleeding disorder, is characterised by recurrent mucocutaneous bleeding secondary to an abnormality in platelet function. Clinical presentations may range from trivial bruising, recurrent epistaxis or gingivitis, menorrhagia, to massive life-endangering bleeding episodes. While some patients may be managed with preventive measures and local antifibrinolytic therapies, others may require frequent hospitalisation for platelet and packed red blood cell transfusions. With early diagnosis and accurate supportive management, this disorder has a favorable prognosis. Here, we report a rare case of Glanzmann Thrombasthenia in a 12 years old female child who presented to us with recurrent episodes of epistaxis and gingival bleeding.

Keywords: *Glanzmann Thrombasthenia, Inherited bleeding disorder, Platelet dysfunction, Mucocutaneous bleeding, Epistaxis, Gingival bleeding*

1. INTRODUCTION

Glanzmann Thrombasthenia (GT) is a rare genetic bleeding disorder with autosomal recessive inheritance. It was first documented in 1918 by Dr. Eduard Glanzmann, who explained this platelet abnormality with abnormal clot retraction and defective appearance on stained film.[1] This is caused by mutations in genes for αIIb or β_3, causing a deficiency of platelet integrin, which is essential for platelet aggregation and homeostasis.[2]

GT is unique and characterised by normal or subnormal thrombocyte count, delayed bleeding time, and deficient or absent platelet aggregation. Thus, GT clinically presents as a bleeding disorder characterized by mucocutaneous bleeding due to a deficiency of platelet function.[2]

The prevalence of GT is approximately 1:1,000,000 in the general population while the prevalence is roughly 1:200,000 or higher in certain regions with high consanguinity (Pakistan, a few Canadian provinces, Newfoundland and Labrador). Females are found to be slightly more affected than males. While the most common age of presentation is childhood, GT can manifest in any age group.[3]

Clinical presentation in patients with GT can be highly variable, ranging from minimal bruising in some patients to potentially life-threatening severe haemorrhage in others. The presence of purpura, petechiae, epistaxis, gingival bleeding, and menorrhagia is frequently seen. Occasionally, patients may present with gastrointestinal bleeding and hematuria.[2,3]

GT is a lifelong disorder with a difficult diagnosis, and the chances of underdiagnosis are high. Hence, it is prudent to consider GT while evaluating patients (especially the paediatric age group) presenting with recurring mucocutaneous

bleeding with a normal platelet count. With early diagnosis and prompt treatment, GT can have a good prognosis, and overall quality of life can be improved.

CASE REPORT

Our patient, 12 years old female, second-order offspring of a third-degree consanguineous marriage, came with complaints of recurrent mucosal bleeding episodes, including epistaxis and gum bleeding for the past 9 years. These episodes of mucosal and mucocutaneous bleeding were often spontaneous. She also had complaints of prolonged bleeding following trivial trauma. Over the last 9 years, she required multiple hospitalisations with moderate to severe, incessant bleeding episodes. The first admission was in view of profuse epistaxis at the age of 5 years, during which she was investigated and found to have anaemia with mild thrombocytosis. She was transfused with packed red blood cell (PRBC) and random donor platelet (RDP). The parents were informed about the possibility of some bleeding disorder but the child wasn't evaluated further then. The second admission, at the age of 8 years, followed mucosal bleeding in the form of hematemesis for 7-10 days. The child underwent upper gastrointestinal endoscopy, but the reports didn't yield a definitive cause. She received another PRBC transfusion for anemia and was discharged home without a detailed evaluation. Although specifics of investigations and treatment were not known to the parents, they were aware that the child had some bleeding disorder requiring special tests for the diagnosis. Eventually, after being treated symptomatically and supportively, including transfusion of blood products, for complaints of recurrent mucosal bleeding for the next 4 years, the child was brought to our hospital for an elaborate workup.

She presented to us with primary complaints of recurring unprovoked gum bleeding every day for the past 14 days. Upon eliciting a detailed history, the mother could recall that child had spontaneous emergence of petechiae right from the 2nd or 3rd month of life, which used to resolve by itself. On thorough clinical examination, severe pallor, gum bleeding, and dental caries were present. She had tachycardia, a hemic murmur and hepatomegaly. She also had failure to thrive. No significant birth or family history was found.

Initially, a complete blood count on admission revealed anaemia with mild thrombocytopenia.

Table 1: Complete blood count

Parameter	Value	Normal Range
Hemoglobin	1.6 g/dL	12–16 g/dL (females)
Total Leucocyte Count	6100 /cumm	4000–11000 /cumm
Platelet Count	1.52 lacs/cumm	1.5–4.5 lacs/cumm
Hematocrit (HCT)	5.6%	36–46% (females)

Peripheral blood smear examination showed clumping of platelets. Prolonged bleeding time was noted. Liver function tests and coagulation profile were within normal range. Screening for Factor XIII was normal. Paediatric haematologist opinion was sought. Upon integrating the clinical and laboratory findings, the child was suspected to be affected with a platelet function disorder. Our differential diagnoses were von-Willebrand disease, Glanzmann thrombasthenia, and Bernard-Soulier syndrome. Due to financial restrains, targeted testing was planned.

While the reports were awaited, the child was stabilised and supportive therapy, including treatment of anaemia and treatment of bleeding episodes with systemic and local antifibrinolytics (tranexamic acid), was continued. The child also received PRBC and RDP transfusions. Hence, platelet aggregation studies were not sent. Instead, whole exome sequencing (WES) was sent as a DNA report would give a more definitive result. A homozygous single base pair deletion in exon 27 of *ITG2B gene* was found, which results in a frameshift mutation. Thus, Glanzmann Thrombasthenia 1 was detected on whole exome sequencing.

The child was advised to use oral and/or local antifibrinolytics for episodes of gum bleeding, epistaxis, or any other form of mucocutaneous bleeding. Dental caries was treated. Nutritional counselling was done, and treatment of anaemia was continued with oral ferrous fumarate and folic acid. Genetic counselling of the parents was done. The condition was explained to them in detail, including complications, prognosis, and the need for further platelet transfusions, especially given menorrhagia when the child attains menarche. The child was also advised regular follow-ups to monitor response to therapy as well as overall physical growth and close development monitoring.

2. DISCUSSION

Glanzmann thrombasthenia (GT) is a rare congenital bleeding disorder wherein there is severely abnormal platelet function

leading to haemorrhagic manifestations. This disorder is characterised by an autosomal recessive inheritance. GT can present with normal or subnormal thrombocytes, normal platelet morphology, delayed bleeding time, and deficiency or absence of platelet aggregation. [2] Although it is an extremely rare disorder worldwide, an increased prevalence is seen with presence of consanguinity and in certain regions and ethnic groups such as- certain Canadian provinces, Pakistanis, South Indians French Gypsies, Iraqi Jews, Jordanian Arabs.[3,4]

This bleeding disorder is caused by mutations in genes for αIIb or β_3, resulting in a deficiency of platelet fibrinogen receptor glycoprotein αIIb-β_3 (or GPIIb/IIIa), which is present on the platelet surface as the major integrin complex. Upon platelet activation, it undergoes conformational changes by inside-out signalling to facilitate fibrinogen binding and platelet aggregation follows. Thus, primary homeostasis takes place. [5,6]

Bleeding in GT can be spontaneous or can be secondary to even trivial injury, with no or abnormally functioning fibrinogen receptors or a deficiency of receptors. Secondary homeostasis is not achieved properly as the platelets are inefficient in producing thrombin, which plays a role in the conversion of fibrinogen to fibrin. This fibrin is needed for platelet plug stabilisation. [6]

An abnormality in either GPIIb or GPIIIa disintegrates the other subunit, causing the same functional defect. The most common mutations seen are deletions or missense mutations in the GPIIb or GPIIIa gene. [2,5]

GT has 3 subtypes- types 1, 2, and variants. In the most prevalent type, type 1, there is a total absence (usually, <5%) of the GPIIb–GPIIIa complex. Whereas in type II, there is a partial shortcoming of GPIIb and GPIIIa (usually, 5%–20%). In the variant type, there is functional impairment of GPIIb and GPIIIa. [7,8]

Platelet function assays in patients with GT are abnormal.[2,6,8] Aggregation studies reveal absent or abnormal aggregation with all agonists (that is, in the presence of epinephrine, collagen, arachidonic acid, ADP) except ristocetin. This is because ristocetin agglutinates platelets and does not require a metabolically active platelet. It is independent of fibrinogen. On the other hand, these other agonists depend on fibrinogen attachment to the platelet for aggregation. [8]

GT can commonly present with recurring purpura/petechiae, epistaxis, gingival bleeding and menorrhagia. Excessive or prolonged bleeding following a minor injury or post-surgery are also seen.[2,8]

Another disorder with severe congenital platelet function, Bernard-Soulier syndrome, which is also inherited in an autosomal recessive manner, is caused by the absence or severe deficiency of vWF receptor on the platelet membrane. Characteristic findings include abnormal platelet morphology (giant platelets are seen on PBS), thrombocytopenia, and prolonged bleeding time. These patients also present with mucocutaneous bleeding, but here the bleeding is seen to be more significant than in GT. A striking difference between the two is revealed in platelet aggregation studies, where ristocetin-induced platelet aggregation is absent and there is normal aggregation to other agonists.[8,9,10]

A confirmatory diagnosis of both, GT and Bernard- Soulier syndrome is made by flow cytometry analysis of the glycoprotein of the patient. The use of flow cytometry can be extended to identify the presence of the GPIIb and GPIIIa complex, GPIIb (CD41), GPIIIa (CD61), and fibrinogen using monoclonal antibodies, which can be used to identify carriers in families of affected patients. Quantification of GPIIb-IIIa by monoclonal antibodies and platelet antigen detection may be then utilised for prenatal diagnosis of Type I GT and recognise the heterozygous state. [2,8,11]

Despite the availability of platelet function tests, molecular characterisation by genetic testing is being preferred increasingly due to its remarkable accuracy in diagnosing cases as well as carriers.[8,12]

There is no known definitive cure for GT. The management of hemorrhage includes prevention and supportive care. Preventive measures comprise of strict practice of dental hygiene and regular dental visits to avert gingivitis and spontaneous gingival bleeding, avoiding drugs that alter platelet functions, such as NSAIDs, and adequate dietary intake as well as supplementation of iron to prevent anemia associated with chronic bleeding. Platelet transfusion before any dental procedure to reduce the risk of hemorrhage. Local antifibrinolytic therapy for minimal mucosal bleeding and platelet transfusions in patients with more significant bleeding have been the cornerstone of supportive management.[2,10] Recently, with the increasing use of recombinant factor VIIa as therapy in patients with GT, there have been exceptional results in the prevention and treatment of hemorrhage. [6,8,13] The use of Desmopressin (dDAVP) in GT has limited clinical usefulness and isn't used routinely. [12] There are rare reports of successful bone marrow transplants but such extreme treatment isn't needed conventionally. [14] Studies on the prospects of stem cell transplantation and gene therapy to be curative in GT are underway. [6,12] However, severe recurrent life-threatening hemorrhages only would necessitate these expensive modalities.

3. CONCLUSION

GT is a rare congenital bleeding disorder with autosomal recessive inheritance, with an increased prevalence in populations with consanguinity. Common clinical presentations include easy bruising, recurrent mucosal bleeding, and menorrhagia. The mainstay of therapy in GT is preventive and supportive care. Control and prevention of bleeding is difficult but of utmost

importance. Diagnosis of GT is challenging but it should always be kept in mind as a possibility while investigating any case of bleeding disorder because GT carries a very good prognosis provided adequate preventive and monitoring strategies along with timely and careful supportive management is followed. Parental counselling along with regular follow up to ensure child's physical growth, development and mental well-being plays an essential role in improving the quality of life in patients with such a chronic disorder.

REFERENCES

[1] Vishal Chakati, Durga Prasad Bukka, Srinivas Rao Erigaisi, Shyam Sunder Anchuri EMJ Hematol. 2021;9[1]:110-113. DOI/10.33590/emjhematol/21-00008. https://doi.org/10.33590/emjhematol/21-00008.

[2] Swathi J, Gowrishankar A, Jayakumar SA, Jain K. A rare case of bleeding disorder: Glanzmann's thrombasthenia. Ann Afr Med. 2017 Oct-Dec;16(4):196-198. doi: 10.4103/aam.aam_59_16. PMID: 29063905; PMCID: PMC5676411.

[3] Iqbal I, Farhan S, Ahmed N. Glanzmann Thrombasthenia: A Clinicopathological Profile. J Coll Physicians Surg Pak. 2016 Aug;26(8):647-50. PMID: 27539755.

[4] Sebastiano C, Bromberg M, Breen K, Hurford MT. Glanzmann's thrombasthenia: report of a case and review of the literature. Int J Clin Exp Pathol. 2010 Apr 25;3(4):443-7. PMID: 20490335; PMCID: PMC2872751.

[5] Krause KA, Graham BC. Glanzmann Thrombasthenia. [Updated 2023 Aug 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK538270/

[6] Solh T, Botsford A, Solh M. Glanzmann's thrombasthenia: Pathogenesis, diagnosis, and current and emerging treatment options. J Blood Med. 2015;6:219–27. doi: 10.2147/JBM.S71319

[7] Varkey I, Rai K, Hegde AM, Vijaya MS, Oommen VI. Clinical Management of Glanzmann's Thrombasthenia: A Case Report. J Dent (Tehran). 2014 Mar;11(2):242-7. Epub 2014 Mar 31. PMID: 24910701; PMCID: PMC4043557.

[8] Botero JP, Lee K, Branchford BR, Bray PF, Freson K, Lambert MP, Luo M, Mohan S, Ross JE, Bergmeier W, Di Paola J; ClinGen Platelet Disorder Variant Curation Expert Panel. Glanzmann thrombasthenia: genetic basis and clinical correlates. Haematologica. 2020 Apr;105(4):888-894. doi: 10.3324/haematol.2018.214239. Epub 2020 Mar 5. PMID: 32139434; PMCID: PMC7109743.

[9] Nurden AT, Caen JP. An abnormal platelet glycoprotein pattern in three cases of Glanzmann's thrombasthenia. Br J Haematol. 1974 Oct;28(2):253-60. doi: 10.1111/j.1365-2141.1974.tb06660.x. PMID: 4473996.

[10] Nurden AT, Nurden P. Congenital platelet disorders and understanding of platelet function. Br J Haematol. 2014 Apr;165(2):165-78. doi: 10.1111/bjh.12662. Epub 2013 Nov 29. PMID: 24286193.

[11] Montgomery RR, Kunicki TJ, Taves C, Pidard D, Corcoran M. Diagnosis of Bernard-Soulier syndrome and Glanzmann's thrombasthenia with a monoclonal assay on whole blood. J Clin Invest. 1983 Feb;71(2):385-9. doi: 10.1172/jci110780. PMID: 6822670; PMCID: PMC436878.

[12] Bellucci S, Caen J. Molecular basis of glanzmann's thrombasthenia and current strategies in treatment. Blood Rev. 2002;16:193–202. doi: 10.1016/s0268-960x(02)00030-9. [DOI] [PubMed] [Google Scholar]

[13] Poon MC, D'Oiron R, Von Depka M, Khair K, Négrier C, Karafoulidou A, Huth-Kuehne A, Morfini M; International Data Collection on Recombinant Factor VIIa and Congenital Platelet Disorders Study Group. Prophylactic and therapeutic recombinant factor VIIa administration to patients with Glanzmann's thrombasthenia: results of an international survey. J Thromb Haemost. 2004 Jul;2(7):1096-103. doi: 10.1111/j.1538-7836.2004.00767.x. PMID: 15219192.

[14] Bellucci S, Damaj G, Boval B, Rocha V, Devergie A, Yacoub-Agha I, et al. Bone marrow transplantation in severe glanzmann's thrombasthenia with antiplateletalloimmunization. Bone Marrow Transplant. 2000;25:327–30. doi: 10.1038/sj.bmt.1702139. [DOI] [PubMed] [Google Scholar]

..