Family Practice Grand Rounds

Hemophilia

William Schwer, MD, Erich E. Brueschke, MD, and Thomas Dent, MD
Chicago, Illinois

DR. ERICH BRUESCHKE *(Residency Director, Professor and Chairman of the Department of Family Practice)*: Today's Family Practice Grand Rounds will be presented by Dr. William Schwer, fourth year teaching Fellow in family practice who is family physician to the patient presented. This case will be presented as a patient management problem in that the initial presentation will be modified and expanded as the information is developed in the patient's history, taking into consideration laboratory and other findings. Pathophysiology will be considered as well those factors having to do with the influence of environmental and social factors on the case presentation and the development of the patient's problems.

DR. WILLIAM SCHWER *(Teaching Fellow, Department of Family Practice)*: M. Q., a ten-month-old white male infant, was brought to the emergency room by his parents who said he had fallen, striking himself on the corner of a table approximately two days prior to the emergency room visit. The child did not have a fever, but seemed to the mother to be more irritable than usual. The child just started to walk and had been falling often. She noted that whenever he had fallen or was picked up, she frequently noticed bruises. She also stated that she tends to bruise easily. The child had no history of hematochezia, hematemesis, hematuria, epistaxis, or bleeding from his gums. The area of injury when he had fallen two days prior to the present visit was the left periorbital area. It had swollen, becoming discolored and painful. His mother was with him at the time he had fallen against the edge of the table. She noted that he presented difficulties in care. Besides the parents, there are no other members in the household. At the emergency room both parents denied striking the child or any other kind of physical disciplinary measures against the child.

The child was delivered at full term by a spontaneous vaginal delivery. It was the first pregnancy for the mother. There were no complications during either the labor or delivery. The child was 7 lb, 11 oz at birth with Apgar scores of 8 and 9. The mother was Rh-negative and received RhoGAM after her pregnancy; the child was Rh-positive. In terms of his development, the child sat up without support at approximately six months and at the time of his presentation to the emergency room had just started to walk. He spoke single words like "ma-ma" and "da-da." His immunizations were up to date. The mother and father were well without any previous health problems. The father stated he had a brother who died at three years of age from some type of leukemia. The maternal family history was remarkable for hypertension and heart disease in the grandparents, and the grandfather had died of lung cancer at 60 years of age.

DR. BRUESCHKE: Are there points in the history that need further clarification or expansion?

DR. THOMAS DENT *(Assistant Director, Family Practice Center and Assistant Professor of Family Practice)*: Was there any use of aspirin or other drug use reported?

From the Department of Family Practice, Rush-Presbyterian–St. Luke's Medical Center and Christ Hospital, Oak Lawn, and Rush-Christ Integrated Residency in Family Practice, Chicago, Illinois. Requests for reprints should be addressed to Dr. Erich E. Brueschke, Department of Family Practice, Rush-Presbyterian–St. Luke's Medical Center, Academic Facility, Room 764, 600 S Paulina St, Chicago, IL 60612.

0094-3509/82/040661-07$01.75

DR. SCHWER: The mother denied aspirin usage by the child.

DR. MICHAEL AUGUSTSON *(Second year family practice resident)*: What is the family situation and structure?

DR. SCHWER: The father is employed as an accountant and the mother is home with the child.

DR. AUGUSTSON: Any special family stress?

DR. SCHWER: The parents denied any special stresses.

DR. BRUESCHKE: Do we have more information on the past medical treatment of this child?

DR. SCHWER: This is the first time that the child had been seen in the emergency room. The patient had never been admitted to the hospital. He had been seen by a pediatrician for routine immunizations.

DR. BRUESCHKE: Do you have any information on when the child was last seen by a physician other than the present emergency room admission?

DR. SCHWER: The child was seen four months earlier for his third set of immunizations.

The child was alert, active, somewhat irritable, and had numerous bruises, ecchymoses, and hematomas of the face, head, trunk, and extremities. There was periorbital swelling and ecchymosis around the left eye and soft tissue swelling of the left posterior cervical region. The eye examination was unremarkable. There were no ocular hemorrhages. The tympanic membranes were normal. Nasal and buccal mucosa were normal. There was no nuchal rigidity. Cardiovascular examination revealed normal first and second heart sounds; there were no third and fourth heart sounds or murmurs. Lungs were clear to auscultation and percussion. The abdominal examination revealed no tenderness, masses, or hepatosplenomegaly. On neurological examination, the motor and sensory systems were normal, the cranial nerves II through XII were intact, and the reflexes were all present and symmetrical. No petechiae were noted.

DR. SCHWER: Any additional questions?

DR. DENT: Were all these bruises noted to be acute?

DR. SCHWER: They were in various stages of the bruising process. The majority of them, however, were recent.

DR. SEEMA MUNIR *(Third year family practice resident)*: Were there any hematomas, any joints that were swollen, or any subcutaneous bleeding?

DR. SCHWER: There was one large subcutaneous hematoma at the posterior cervical area.

DR. BRUESCHKE: Do you have any further questions regarding history or physical examination?

DR. MUNIR: Was there any history that the mother can give about prolonged bleeding after the circumcision?

DR. SCHWER: The mother stated that following the circumcision the child had bright red bleeding for two to three days and there was oozing for 17 days. He was, however, discharged with his mother and she had not brought him back to her pediatrician concerning the oozing.

DR. DENT: Were there any reports of difficulty after immunizations?

DR. SCHWER: No. The mother denied any kind of abnormal bleeding or bruising after immunizations.

JERRY HILLER *(Social worker for Christ Hospital)*: You said that the mother thought that the child was difficult to take care of?

DR. SCHWER: She related that since he had just started to walk, he was getting into everything and falling all the time; she couldn't watch him every second. It seemed to her that every time he fell, he bruised. She described him as a very active child.

DR. AUGUSTSON: How did she feel about having such an active child?

DR. SCHWER: Her only concern was that he did bruise somewhat easily, but she had never brought that up with the pediatrician. She noticed the marked amount of bruising only since he had started to walk. She had noted that in the past when people would pick the child up, he would bruise in the area where they had held him. She had not been concerned until he had begun to walk and the bruising became marked.

DR. BRUESCHKE: Would someone suggest a working diagnosis and the immediate handling of the patient?

DR. MUNIR: We have under discussion a ten-month-old child with multiple bruises, ecchymotic areas, and a subcutaneous hematoma. The differential diagnosis should include a bleeding disorder and possible child abuse. I think this child warrants admission to the hospital and workup.

DR. SCHWER: As the emergency room physi-

Continued on page 664

Continued from page 662

cian or the primary care physician at the time of admission, what are your duties? What must you do if you think this is a possible case of child abuse?

DR. TIMOTHY KNOX *(Second year family practice resident)*: I would have to admit the child to the hospital and notify the Department of Children and Family Services (DCFS) of Illinois.

DR. SCHWER: There is a social worker attached to the emergency room. You would notify the social worker. Jerry, if there is a case of suspected child abuse in the emergency room, what are the duties of the physician?

MR. HILLER: If the physician suspects child abuse and/or neglect, the child should be admitted for treatment or protection and a report made to the DCFS. A great deal of effort should be taken to get parental consent for the child's admission. The physician should emphasize the importance of the child receiving the proper care. If there is an immediate threat to the child's life, he should be admitted with or without the parent's consent. If the parents do not grant consent, the physician should contact DCFS and take protective custody.

DR. SCHWER: Does the physician need to report immediately, the day the child is admitted, or can he or she wait a day until a bleeding disorder has been ruled out?

MR. HILLER: If the child is going to be hospitalized, then the physician has more time to work. But the report should be made as soon as possible. Under the law, abuse occurs when the person responsible for the child's welfare inflicts, causes, or allows any of the following: excessive corporal punishment, serious physical injury, death, disfigurement, torture, loss or impairment of any bodily function, impairment of physical or emotional health, sex offense defined in the Criminal Code of 1961, or creation of substantial risk of serious physical injury to the child. Neglect occurs when a person responsible for a child's welfare abandons the child or fails to provide the proper or necessary support, education, or medical or other remedial care necessary for the child's well-being. That is quoted from the Child Abuse Act. In all cases, I feel that the parents should be told what is going on. I would tell the parents that I am concerned about these bruises and that I am uncertain what is

Continued on page 669

Continued from page 664

causing them. I would explain to the parents that we are required by law to report any signs of suspected abuse to DCFS. The feeling I would try to convey to the parents as the physician or as a social worker would be that the most important thing right now is what is going to happen to the child in the hospital. In addition, however, we are required to meet certain standards, and the parents will be contacted by DCFS. So, the physician is informing the parents what he has to do but the primary focus is what is happening with the child now.

DR. DENT: Would you state in the emergency room that you suspected child abuse? Since the parents were concerned enough to bring the child to the emergency room, and presumably concerned enough to agree to have the child admitted, would you recommend confrontation in the emergency room by mention of nonaccidental trauma or child abuse, or would you defer that until later during the hospitalization?

MR. HILLER: I think that it would be important to find out whether these bruises could be accidentally caused. Are the type of bruises the kind a child would get in the manner the mother described?

DR. SCHWER: This patient had uncommon areas involved in bruising. The extremities are areas commonly involved with bruises, but large ecchymotic areas on the abdomen, thorax, back, and buttocks are not often seen with falls.

DR. DENT: It is clearly an excessive amount of bruising.

MR. HILLER: It is important how the bruising is presented to the parents. This child has an excessive amount of bruising and it is important to find out more about the causes. This child is up to date on his immunizations and seems to be well taken care of. I would be interested in interviewing the parents to see what their attitude is concerning the bruising.

DR. SCHWER: Do the local police have to be notified as soon as child abuse is suspected?

MR. HILLER: According to the law in the state of Illinois, the Department of Children and Family Services must be notified directly. In Illinois you may, if you choose, also file a report with the local law enforcement agency. The police can be contacted for assistance in all instances. Sometimes DCFS calls upon the police and sheriff for assistance in conducting the investigation or in ensuring the protection of the child.

DR. SCHWER: The initial impression of the physicians at the time of admission was that the child may be a victim of child abuse. At the time of admission, DCFS and local police were informed, and the police did talk with the parents.

DR. DENT: Once you approach the patient's parents and they are willing to admit the child to the hospital, the child is then under observation and supervision. At that point there is a greater opportunity to explore not only medical but emotional situations. I believe that DCFS should be notified, but there would be greater urgency if the parents were demanding to leave with the child from the emergency room or from the office. It is better not to have confrontations in the emergency room, usually a difficult place in which to communicate and certainly not very private. In my opinion, it is better to admit the child and then proceed with the investigation.

DR. SCHWER: In this case that was not done, and the parents were very upset about police intervention.

If the parents were not willing to admit the child, however, who would take custody of the child? The hospital, the courts, or the police?

MR. HILLER: If abuse or neglect is suspected, and if the parents either refuse to have the child admitted or want to take the child out of the hospital, the physician should call DCFS and tell them that he is taking protective custody. DCFS, in turn, will then go to the courts and file a petition to get protective custody. If you decide not to report, you are, as the physician, assuming full responsibility. If you call DCFS, you are sharing that responsibility.

DR. SCHWER: The parents have agreed to admit the child. They are worried about the child. What are the initial things that you should do for this child?

DR. DENT: One should establish if there is an abnormal clotting or hemostasis mechanism. Basic tests would be prothrombin time (PT), platelet count, partial thromboplastin time (PTT), and a bleeding time. The family history in this case is not positive for classic hemophilia, but in 20 percent of the cases there is no family history.[1] The history of the oozing circumcision is very suggestive of hemophilia. If this is a classic case of hemophilia, there would be a normal prothrombin time, reflect-

ing a normal extrinsic clotting system, and an abnormal partial thromboplastin time with normal bleeding times and normal platelet count. One cannot distinguish between factor VIII or IX deficiency by these tests.

DR. SCHWER: In terms of child abuse the most important thing is documentation. A drawing is important and helpful if the case should go to court. A bone survey, looking for old healed fractures or new fractures, has to be done. It is interesting to note that this child did have an old healed fracture of the left clavicle. The documentation was done, the bone survey completed, and the clotting studies came back the next day. The PT was normal, the platelet count was normal, the bleeding time was normal, and the PTT was markedly elevated at about 80 seconds; therefore, this child had a severe disorder of the intrinsic clotting mechanism.

DR. DENT: The basic question given that data is whether there is a factor VIII or factor IX deficiency. The studies to distinguish between these two should be done at a specialized laboratory.

DR. SCHWER: The patient had not had any melena, hematochezia, or hematemesis. Is that important?

DR. DENT: It is important because bleeding from mucous membrane surfaces is more characteristic of platelet deficiency. Long bleeding after minor trauma is more characteristic of hemophilia. Absence of epistaxis, melena, or hematochezia is more in favor of the hemophilic process. Presence of petechiae is indicative of a platelet deficiency or disorder rather than hemophilia.[2] Von Willebrand's disease is characterized by abnormal platelet function as demonstrated by a prolonged bleeding time and also by an intrinsic clotting system disorder with a prolonged PTT. Von Willebrand's disease usually has an autosomal mode of inheritance *v* the X-linked recessive form of inheritance seen with hemophilia A and B (factors VIII and IX deficiency, respectively).[3,4] There are specialized tests that can be used to ascertain whether von Willebrand's disease is present. In hemophilia A there is an abnormal factor VIII produced and the factor VIII antigen is present. With von Willebrand's disease there is no factor VIII antigen.[4]

DR. MUNIR: In factor VIII deficiency, if the patient has up to 50 percent deficiency, there may not be any kind of bleeding. If there is between 5 to 25 percent of normal factor VIII level, there may be bleeding only with major trauma. If the factor VIII level is between 1 and 5 percent, then there may be bleeding with mild to moderate trauma. If there is less than 1 percent factor VIII, there may be spontaneous bleeding.[5]

DR. DENT: The PTT is not a very sensitive screening test. Even with levels down between 5 to 25 percent of normal, there may be only very minimal prolongation of the partial thromboplastin time. Consequently, when there is a strong suspicion of hemophilia prior to any kind of surgery, the PTT is not sufficient in itself to exclude a mild degree of hemophilia; actual assays of factors VIII and IX must be done.[6]

DR. SCHWER: In this patient all of the factor assays were normal except for factor VIII, which was found to be 3 percent of normal.

How would you treat this patient? Treatment of hemophilia has changed in the last 10 to 15 years. What would be your treatment of choice in view of pooled precipitates that are now available?

DR. DENT: For factor VIII deficiency, cryoprecipitate is not used so much as it was previously, even though it is considerably less expensive than factor concentrate. The factor VIII concentrate is favored for several reasons. There is greater uniformity of the factor in each unit compared with cryoprecipitate. The volume of the concentrate is far less, so there is less risk of volume overload. The key point is that the concentrates can be easily used, and patients can be trained for home treatment, which offers the hemophiliac the best means of preventing future disability from hemophilia. Factor VIII concentrates can be stored at 4°C for up to two years, so they can be easily maintained in a home environment. The difficulty with the factor VIII concentrates is the risk of hepatitis. It is much higher with factor VIII than with the cryoprecipitates.

DR. SCHWER: That is because the factor VIII concentrate comes from more patients. Fresh, frozen plasma was the treatment of choice for factor IX deficiency before the concentrate became available. Fresh, frozen plasma contains no factor VIII, however.[7] The real advancement with concentrate is that it has become so convenient that the patient now can be placed on home care.[8,9] The major thing that prevents disabilities is early cessation of bleeding. As soon as hemophiliacs injure

Continued on page 672

Continued from page 670

themselves and swelling starts, or there is pain, they can then give themselves the factor VIII, and that will prevent disabilities in the future.[10] Even though the primary care physician can manage the care of the patient with hemophilia, it is suggested that once or twice a year the family bring the child to a center for hemophiliacs, where there would be not only a hematologist but also physicial therapists and a social worker.[9,11,12] It is important that the parents become involved in the Hemophiliac Society. The parents do need support. It is important that family physicians view this illness as a family problem as opposed to just a problem for the child. In terms of the mother, it is important that the mother be studied to decide whether she is a carrier.

DR. AUGUSTSON: After the cause had been determined, how did the mother respond to the health care providers after she had been accused of child abuse?

DR. DENT: Initially the child was admitted under the care of an attending pediatrician. One of our family practice residents was doing a pediatric rotation; he spent quite a bit of time with the parents, and they later transferred care to him. They were very discouraged and upset about the treatment in the emergency room, which involved interviews in the middle of the night, not only with the emergency room personnel, including the social worker, but also with the police. They were able to maintain the rapport with the family practice resident, and the family still is being followed in the Family Practice Center.

DR. MUNIR: It is important to keep in mind that hemophiliacs should be kept up to date as far as immunizations are concerned. For example, they seem more prone to tetanus infections than the normal population.[13]

If there is severe bleeding into a joint, factor VIII should be given; after the levels are sufficiently high, the joint should be aspirated to prevent joint deformities.

DR. DENT: I would disagree with that. Joint aspiration of hemophiliacs has not been proven to be associated with significant improvement in joint function.[6] The primary treatment is very early, aggressive treatment of any sort of pain or bleeding.

Continued on page 674

Continued from page 672

DR. MUNIR: Five percent of patients can develop an antibody to the factor VIII. In those cases factor VIII concentrate should be given less frequently than would be done for a person who does not have this antibody.[1]

DR. SCHWER: Once a year the patient should be checked for the presence of antibody to factor VIII. Treatment is very difficult for someone who has developed antibodies to factor VIII, and it is outside the realm of the family physician to take care of this problem.

DR. BRUESCHKE: Thank you, Dr. Schwer, for illustrating through this interesting case the necessity to remain alert to all possibilities as to the cause of the patient's problem and the necessity to handle the interpersonal aspects of patient care carefully to retain patient confidence and follow-up. This case particularly illustrates that while a presenting complaint may be substantiated by the physical findings, early evidence of psychosocial problems may mislead the family physician into an erroneous early conclusion which may then adversely affect the physician's ability to intercede for the benefit of the patient and the family.

References

1. Hilgartner MW (ed): Hemophilia in Children. Littleton, Mass, Publishing Sciences Group, 1976

2. Biggs R (ed): Human Blood Coagulation: Haemostasis and Thrombosis, ed 2. Oxford, Blackwell Scientific Publications, 1976

3. Buchanan GR, Holtkamp CA: Prolonged bleeding time in hemophilia. Clin Res 27:806, 1979

4. Hoyer L: Von Willebrand's disease. Prog Hemost Thromb 2:231, 1976

5. Buchanan GR: Hemophilia. Pediatr Clin North Am 27:309, 1980

6. Hathaway WE, Assmus SL, Montgomery RR, et al: Activated partial thromboplastin time and minor coagulopathies. Am J Clin Pathol 71:22, 1979

7. Biggs R (ed): The Treatment of Haemophilia A and B and von Willebrand's Disease. Oxford, Blackwell Scientific Publications, 1978

8. Agle DP, Hilgartner MW, Lazerson J, et al: Home Therapy for Hemophilia: A Physician's Manual. New York, National Hemophilia Foundation, 1977

9. Levine PH: Efficacy of self-therapy in hemophilia. A study of 72 patients with hemophilia A and B. N Engl J Med 291:1381, 1974

10. Striling ML, Prescott RJ: Minimum effective dose of intermediate factor VIII concentrate in haemophiliacs on home therapy. Lancet i:813, 1979

11. Boone DC (ed): Comprehensive Management of Hemophilia. Philadelphia, FA Davis, 1976

12. Rabiner SF, Lazerson J: Home management and prophylaxis of hemophilia. Prog Hematol 8:223, 1973

13. Isselbacher KJ, Adams RD, Braunwald E (eds) et al: Harrison's Principles of Internal Medicine, ed 9. New York, McGraw-Hill, 1980, p 1562