

## EDEMA

*You are starting your outpatient month in a primary care physicians' office. He asks you to see his first patient, an add-on this morning. He tells you that 7 year old Michael is healthy, having been seen mostly for his annual physical examinations and a rare febrile illness.*

CC: swelling around his eyes for a few days.

HPI: Michael's mother brought him in today because of increasing swelling around his eyes for the last few days. She first noticed it when he returned home from his baseball game. He thought that his eyes were a little itchy but otherwise said that he felt fine. The area all around the eye appears to be puffy and getting tighter and tighter. He does not think that his vision is any different. He has no discharge from the eyes. Mom does not think that he has had a fever and the area does not seem to be red. It is not painful.

She noticed that he seemed to be a little more tired than usual. He is going to bed at 7:30, when he usually tried to stay up past his bedtime of 8 p.m. He told his baseball coach that he was too tired to play in the last two innings of his game tonight. Mom thinks that he has been "loggy" for the last several days.

Michael does not want to play outside as much as he used to. He has been more interested in the computer games that he has and in watching cartoons on TV. Mom decided to bring him in when he started to gain weight and now his clothes do not fit any more.

PMH: 3 ear infections all before 18 months of age

Occasional episodes of eczema requiring low potency steroid creams to treat them

Immunizations: up to date.

Pregnancy: uneventful. Delivered at 39 weeks, spontaneously went into labor and delivered vaginally. Home with mom. Had bilirubin check twice, but never treated.

Dev: attended Headstart and did well. Started kindergarten and had a hard time settling down to do the work, so his teacher suggested that he repeat it. He did much better the second time. And now is in first grade and seems to be doing well.

FHx: Dad had asthma in childhood, but outgrew it. Mom is well G3 P2. Michael's 14 year old sister is well. His grandparents have been healthy though both of his father's parents have hypertension.

Soc: Lives at home with his mother, father, older sister and maternal grandmother. She does part of the after school care. He attends a neighborhood school and has repeated kindergarten. He plays baseball in the spring and soccer in the fall.

### Physical Examination

General: A cute African American boy who is sitting on her lap, leaning on his mother quietly talking to her as you enter. He is obviously puffy around his eyes and you can barely see the opening. He had a big, round, belly and puffy arms and legs as well.

VS: HR: 135 RR: 20 T: 38.2 ax BP: 78/47 O2 sat: 96%

Ht: (65%) Wt: (>90) HC: (55%)

HEENT: normal head but very puffy eyelids. He is also full in the parotid area.

Neck: hard to find but no obvious adenopathy

Chest: absent breath sounds at the bases and dull to percussion there. Good air entry above there. Symmetrical breath sounds

Cor: regular, rapid, normal S1 and S2 splits. Possible soft S3, without rub.

Abdomen: protuberant. Soft, occasional bowel sounds. Dull to percussion.

Ext: diffusely puffy, though no pitting edema or cyanosis or clubbing.

Skin: pale, dry, no rash. Mucous membranes tachy.

Neuro: alert, can converse, though only speaks a few words at a time. DTR and strength seem in tact.

#### Database:

CBC 14.5 315  
30.1  
75Seg 10 bands 10 Lym 2 mono

Lytes 128 101 28  
3.9 19 0.4 98

Albumin 2.0

T. prot 5.2

Calcium

Cholesterol 315

Blood culture - positive for pneumococcus after 24 hours.

Urine analysis – No heme, glucose, ketones, 4+ protein.

No leukocyte esterase or nitrites.

Urine culture - no growth

Chest x-ray - fluid in the fissures and bilateral pleural effusions. Heart size normal.

No clear infiltrates.

## **Hospital course**

Michael was admitted and rapidly improved.

### Fluids and electrolytes

On admission, Michael was felt to be intravascularly dehydrated and total body fluid overloaded. Therefore, he received gentle diuresis with 0.5 mg/kg of IV furosemide. After a few hours, he received IV albumen followed by furosemide and had a massive diuresis. He had this three additional times over the first two days of hospitalization.

### Renal

Based on his low protein and albumen, his high cholesterol and his dramatic clinical response, Michael was diagnosed with nephrotic syndrome. The most likely etiology was felt to be minimal change disease. Therefore he received 2 mg/kg/d of prednisone divided into three doses a day. His edema rapidly resolved and the protein on his urine dipstick cleared after 5 days. He was discharge home to continue this same dose of steroids, check the protein in his urine every morning and return for follow up in 3 weeks.

### Infectious Disease

Michael's pneumococcal bacteremia was treated with IV ampicillin for 5 days and then orally for five more days. He remained afebrile after 12 hours of treatment and throughout the rest of his hospitalization. Follow-up cultures were negative.

### Health Maintenance

Michael was up to date on his immunizations and his home situation was stable. Therefore, he was sent home with his parents. He was advised not to overextend himself in his activities. He was allowed to return to school once he finished his antibiotics.

## **Follow-up**

Over the next several months, Michael was hospitalized about once a month with recurrent nephrotic syndrome. He missed 4/6 of his follow-up appointments and when he did come, he was hospitalized twice right from the office. All of the hospitalizations were associated with bacterial peritonitis from pneumococcus and once meningococcus. He always responded quickly to steroids and antibiotics, with rapid clearing of the protein in his urine.

When asked about his medications at home, Michael clearly was not taking any medicine. He did not know the dose or time or what it tasted like. He did not look Cushingoid. He did his urine testing once a week on his own.

His mother stated that Michael took all of his medicine, just as it was ordered. Michael stated that he liked being in the hospital since he got to see his mother then.

1. Why is Michael being hospitalized recurrently?
2. What is the root of the problem?
3. How would you intervene?