

A 5-year-old boy is brought to the physician due to a 1-week history of generalized edema, fatigue, and abdominal pain. Otherwise, he has been well and his medical history is unremarkable. The patient takes a daily multivitamin and no other medications. Blood pressure is 92/55 mm Hg and pulse is 90/min. Periorbital edema and 1+ pretibial edema are found on examination. The scrotum is mildly swollen but nontender. Abdominal examination is unremarkable. Urinalysis results are as follows:

Specific gravity	1.028
pH	5
Protein	4+
Blood	negative
Casts	none
Crystals	none

Which of the following light microscopy findings would be expected if a kidney biopsy were performed?

- ☐ A. Crescent formation
- ☐ B. Diffuse thickening of basement membrane
- ☐ C. Mesangial hypercellularity
- ☐ D. Normal findings
- ☐ E. Subepithelial spikes

Submit

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Crystals	none

Which of the following light microscopy findings would be expected if a kidney biopsy were performed?

- ☐ A. Crescent formation [2%]
- ☐ B. Diffuse thickening of basement membrane [7%]
- ☐ C. Mesangial hypercellularity [3%]
- ☒ D. Normal findings [85%]
- ☐ E. Subepithelial spikes [3%]

Proceed to Next Item

Explanation:

User Id: [REDACTED]

Minimal change disease	
Epidemiology	<ul style="list-style-type: none">• Most common cause of nephrotic syndrome in children• Median age 2-3
Pathogenesis	<ul style="list-style-type: none">• T cell-mediated injury to podocytes

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Explanation:

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Minimal change disease	
Epidemiology	<ul style="list-style-type: none">• Most common cause of nephrotic syndrome in children• Median age 2-3
Pathogenesis	<ul style="list-style-type: none">• T cell-mediated injury to podocytes
Clinical features	<ul style="list-style-type: none">• Edema• Fatigue
Diagnosis	<ul style="list-style-type: none">• Proteinuria• Renal biopsy without microscopic changes
Treatment	Corticosteroids

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This child's generalized **edema**, **fatigue**, **abdominal pain** (from rapid fluid accumulation), and **proteinuria** are consistent with nephrotic syndrome. The most likely diagnosis is **minimal change disease (MCD)** as it accounts for 80% of pediatric nephrotic syndrome cases. Children age <10 with isolated nephrotic syndrome usually do not require biopsy for diagnosis as MCD is highly likely. If performed, light microscopy of tissue obtained from renal biopsy usually demonstrates **normal renal architecture**; immunofluorescence staining of the glomeruli also shows no abnormality. Diffuse **effacement of foot processes** of podocytes (renal epithelial cells) on electron microscopy is confirmatory for MCD.

The majority of patients respond rapidly to **corticosteroid** therapy; >90% of children have **complete remission** with the disappearance of proteinuria. Therefore, biopsy is reserved for steroid-resistant or progressive disease. Older children or adolescents should undergo renal biopsy to exclude other causes of nephrotic syndrome.

(Choice A) Crescent formation is a typical finding of rapidly progressive glomerulonephritis, which is a severe condition associated with a rapid decline in renal function and crescent formation in the majority of glomeruli.

(Choices B and E) Thickened basement membrane and subepithelial "spikes" are

Treatment

Corticosteroids

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(Choice A) Crescent formation is a typical finding of rapidly progressive glomerulonephritis, which is a severe condition associated with a rapid decline in renal function and crescent formation in the majority of glomeruli.

(Choices B and E) Thickened basement membrane and subepithelial "spikes" are pathognomonic for membranous glomerulonephritis, which is one of the most common causes of nephrotic syndrome in adults. However, it is rare in young children.

(Choice C) Mesangial hypercellularity is suggestive of membranoproliferative glomerulonephritis, which most commonly presents with nephritic syndrome rather than nephrotic syndrome. It is uncommon in young children.

Educational objective:

Minimal change disease is the most common cause of nephrotic syndrome in preadolescent children. Renal biopsy shows normal kidney architecture but is not routinely obtained in patients age <10. Steroids are the treatment of choice.

References:

1. [Minimal change \(steroid sensitive\) nephrotic syndrome in children: new aspects on pathogenesis and treatment.](#)
2. [The nephrotic syndrome.](#)