

# Genital Neurofibromatosis Presenting as Painful Clitoromegaly



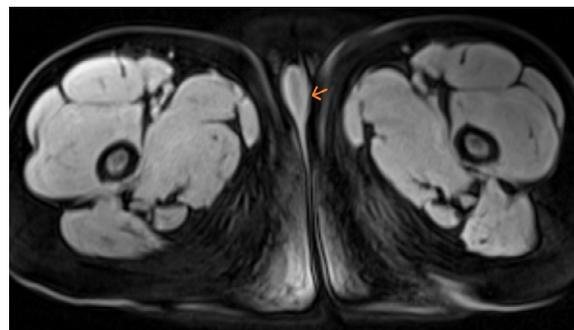
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Neurofibromatosis type 1 (NF1) is a neurocutaneous disorder caused by a mutation on chromosome 17 of the gene for neurofibromin. Patients with this condition are prone to develop benign and malignant tumors of the central and peripheral nervous systems. Genitourinary involvement in children with NF1 is uncommon and primarily affects the bladder. External genital manifestations of NF1 are rare with sporadic reports of children presenting with enlargement of their penis, clitoris, or labia due to a neurofibroma. We present a case of painful clitoromegaly due to a plexiform neurofibroma in a child. *UROLOGY* 133: 219–221, 2019. © 2019 Elsevier Inc.

A 6-year-old female was referred to our Pediatric Urology clinic for evaluation of painful clitoromegaly. She had a known diagnosis of Neurofibromatosis type I (NF1) secondary to the finding of multiple cutaneous features and positive genetic testing, however had never been found to have a clinically significant neurofibroma. Her mother reported first noticing enlargement of her clitoris around 3 years of age. Slow and progressive increase in the size of her clitoris and significant and worsening genital pain continued over 3 years, which prompted a Pediatric Endocrinology evaluation. This investigation found no evidence of precocious puberty or hormonal abnormalities. At the time of her urologic evaluation, her genitourinary exam demonstrated significant enlargement of her clitoral hood both in longitudinal length and circumferential girth. She had less impressive but increased size in her clitoris with a firm subtle mass over the left dorsal aspect. (Fig. 1) A MR of her pelvis demonstrated a subtle T2 hyperintense, heterogeneous lesion with nodularity along the left lateral aspect of the clitoris and left corporal body consistent with a neurofibroma. (Fig. 2) Because of her genital pain and significant clitoral enlargement, the decision was made to proceed with surgical excision of the neurofibroma with clitoral preservation. No abnormalities were found on cystourethroscopy and vaginoscopy. Following degloving of her clitoris, the neurofibroma was found to be densely adherent to the clitoral skin and extended from the hood proximally along the dorsal left corporal body to the pubic bone proximally. The mass did not grossly extend deep to Buck's fascia and was mobilized off the corporal body and excised without significant loss of the overlying skin.



**Figure 1.** Intraoperative photograph demonstrating degree of clitoromegaly. (Color version available online.)



**Figure 2.** MR of pelvis with arrow indicating subtle hyperintense lesion over left lateral aspect of clitoris. (Color version available online.)

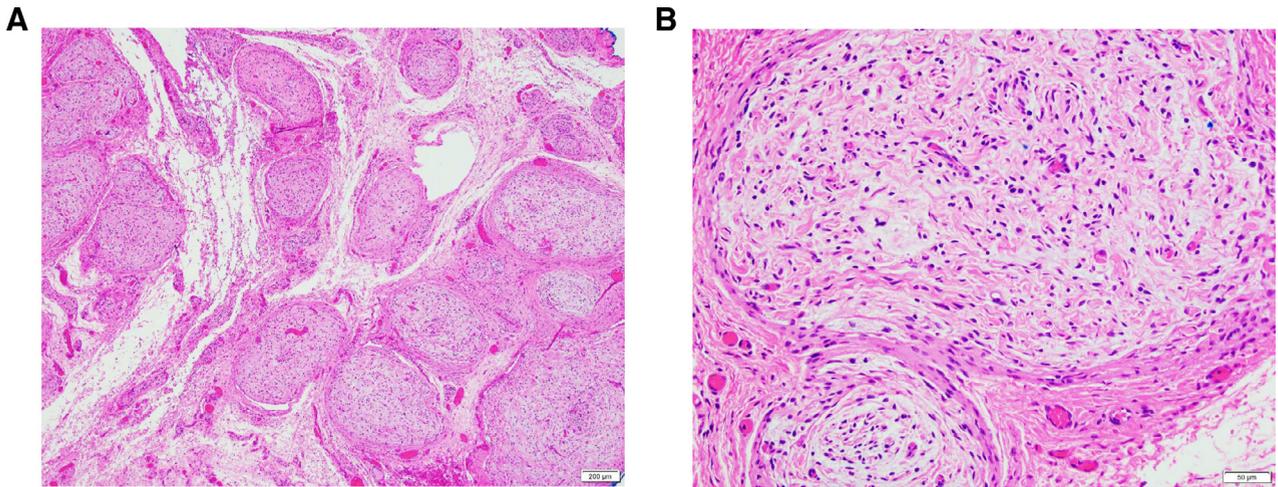
**Conflicts of Interest:** All the authors declare that they have no conflict of interest.

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**Figure 3.** (A) (40× magnification) and (B) (400× magnification) demonstrate a plexiform neurofibroma characterized by expansile serpiginous nerve fascicles with a myxoid stroma and scattered eosinophilic spindle cells. (Color version available online.)

A clitoroplasty was then performed which involved remodeling of the clitoral hood and shaft skin. Pathologic examination demonstrated plexiform neurofibroma characterized by expansile serpiginous nerve fascicles. (Fig. 3A,B) Sixteen months following the excision she has normal appearing genitalia and no evidence of recurrence.

## DISCUSSION

NF1 is an autosomal dominant progressive disorder with an incidence of approximately 1 in 3000 live births. Neurofibromas can affect any body structure and are found in 27% of patients with NF1.<sup>1</sup>

Neurofibromas are categorized as either solitary, which follow a cutaneous-subcutaneous distribution, or plexiform, which travel along the course of peripheral nerves towards a specific body structure.<sup>2</sup> Cutaneous neurofibromas are more common, manifest around the age of puberty, and have not been shown to garner malignant potential.<sup>3</sup> Plexiform neurofibromas are congenital, tend to be more invasive of surrounding structures, and have the potential to transform into malignant peripheral nerve sheath tumors.<sup>3,4</sup>

Neurofibromas involving the external genitalia are rare with approximately 30 reported cases. McDonnell in 1936 first reported a patient with external genitalia manifestations of the condition involving his penis in addition to his bladder and prostate.<sup>5</sup> Haddad et al first described a neurofibroma involving the clitoris in 1960.<sup>6</sup>

Most children with genital neurofibromatosis present with signs of progressive, increased genital size without the primary complaint of genital pain as described by our patient. Other commonly reported genitourinary signs and symptoms include frequency, urgency, hematuria, and difficulty voiding as genital neurofibromas can have concomitant lower urinary tract involvement.<sup>7</sup>

Genital neurofibromas are typically plexiform. Surgical resection has been regarded as the treatment of choice for these lesions given their malignant potential and progressive growth. No recurrences have been reported following adequate excision, although reported follow-up has been limited and no longer than 1 year.<sup>1,7</sup> Our patient has the longest reported follow-up without recurrence at sixteen months.

Routine cystourethroscopy at the time of genital excision has been suggested by Rink and Mitchell, as they noted that cases involving the bladder can have simultaneous genital involvement.<sup>8</sup> However with recent advancement in genitourinary imaging, routine endoscopy at the time of surgery excision may no longer be necessary.<sup>1</sup> In addition to our patient presenting with genital pain, another unique aspect of this case was the involvement of the clitoral hood with absence of further infiltration of the clitoris, external genitalia, or urinary tract.<sup>9</sup> Previous reports demonstrate less than 10% of patients have neurofibromas involving only the clitoral hood and shaft skin.<sup>10</sup>

## CONCLUSION

Genital neurofibromatosis is a rare finding in patients with NF1. Clitoromegaly can occur in these patients with symptoms of genital pain and enlargement of the clitoris due to neurofibroma involvement of the clitoral skin.

## References

1. Cost NG, Sanchez FS, Weinberg AG, et al. Neurofibromatosis presenting as painless clitoromegaly. *Urol J.* 2009;6:220.
2. Pascual-Castroviejo I, Lopez-Pereira P, Savasta S, et al. Neurofibromatosis type 1 with external genital involvement presentation of 4 patients. *J Pediatr Surg.* 2008;43:1998.

3. Ferner RE, Huson SM, Thomas N, et al. Guidelines for the diagnosis and management of individuals with neurofibromatosis 1. *J Med Genet.* 2007;44:81.
4. Boyd KP, Korf BR, Theos A. Neurofibromatosis type 1. *J Am Acad Dermatol.* 2009;61:1.
5. McDonnell CH. Neurofibromatosis of the bladder and prostate. *Am J Surg.* 1936;34:90.
6. Haddad HM, Jones HW Jr. Clitoral enlargement simulating pseudo-hermaphroditism. *AMA J Dis Child.* 1960;99:282.
7. Kearse WS Jr, Ritchey ML. Clitoral enlargement secondary to neurofibromatosis. *Clin Pediatr.* 1993;32:303.
8. Rink RC, Mitchell ME. Genitourinary neurofibromatosis in childhood. *J Urol.* 1983;130:1176.
9. Griebel ML, Redman JF, Kemp SF, et al. Hypertrophy of clitoral hood: presenting sign of neurofibromatosis in female child. *Urology.* 1991;37:337.
10. Sutphen R, Galan-Gomez E, Kousseff BG. Clitoromegaly in neurofibromatosis. *Am J Med Genet.* 1995;55:325.