

## Case Study

### Erythema Induratum of Bazin in an eleven year-old boy: A case report

Kahkashan Mumtaz <sup>1</sup>, Bela Verma <sup>1</sup>, Raju P. Khubchandani <sup>1</sup>, Manju Vani Sake <sup>1</sup>, Kriti Nautiyal <sup>1</sup>, Snehal Sonuane <sup>1</sup>

#### Author's Affiliation:

1- Department of Pediatrics, Grant Government Medical College and Sir J.J.Hospital, Mumbai, India.

#### Correspondence:

Kahkashan Mumtaz, Email: km.simran2011@gmail.com

Received on: 18-Jul-2021

Accepted for Publication: 02-Mar-2022

Tuberculosis (TB), a widespread disease in developing countries, has seen an increasing incidence among the pediatric population, which has caused a rise in the accompanying extra pulmonary manifestations of TB. Cutaneous TB, a type of extra pulmonary manifestation, presents a complicated clinical picture, and because of its non-pathognomonic findings, a clinic pathologic correlation is required. We present an 11-year-old boy, with Erythema Induratum of Bazin(EIB), who initially presented with multiple subcutaneous nodules with joint pains. The relation between EIB and TB is common in adulthood, and many authors advocate anti-TB treatment even if the association to TB is not found.

Our case-report sheds light on the advancements of EIB among the pediatric population and emphasizes that one should have a low threshold for identification, investigation, and treatment of tubercles in the pediatric age group.

## INTRODUCTION

Tuberculosis (TB) is one of the most prevalent diseases among the developing countries and an ever-increasing international communication can make TB a potential threat to global health. In the pediatric population, the incidence of TB has increased worldwide over the last decade. Over 2 hundred thousands children become ill with TB each year <sup>(1)</sup>, with pulmonary TB being the most common, and the extra pulmonary manifestations taking up a larger chunk of cases in adult populations. However, the increasing incidence of TB among children might cause an accompanying advancement of extra pulmonary manifestations in the pediatric population.

Cutaneous TB, an uncommon manifestation of extra pulmonary TB, is of two major types: "True cutaneous TB" and "Tuberculoid" <sup>(2)</sup>. They may present as papules, macules, patches, nodules, abscesses, erosions, or ulcers, mimicking multiple skin diseases. Erythema Induratum of Bazin (EIB), one such type of Cutaneous TB, is complicated in its clinical presentation and pathogenesis.

EIB presents as a subcutaneous nodule which can ulcerate, typically among women in their lower extremities. Histology slides show granulomatous panniculitis with extensive vasculitis <sup>(3)</sup>. Because of its controversial relation to TB, it took years of debate for it to get accepted as a true tuberculoid, and histologically get classified as a type of nodular vasculitis.

We describe an 11-year-old Indian boy with EIB. This case-report substantiates the importance of early diagnosis, lab-tests, and treatment of EIB among children.

## CASE REPORT

An 11-year-old Indian boy, 2nd by birth order, born of non-consanguineous marriage, presented with multiple (three) subcutaneous nodules for 4 months, which were gradual in onset, progressive and migratory. The condition first appeared on the extensor aspect of his left elbow, later developing at the same location in the right elbow (Fig1). The nodules on both sides were initially painless and subsided on their own with no scars/pigmentation; gradually progressed to pain and swelling in the affected region. The child did not have associated fever, rash, cough/cold, and abdominal symptoms. On investigation, raised ESR and nonreactive ASO, ANO titers were found. An interesting finding, though, was the absence of a BCG scar on the kid's arm. One day after admission, the child developed pain and swelling in his left knee.

We sought expert opinion from a senior rheumatologist. Mantoux test was a positive result (18mm), and Chest X-ray revealed bilateral hilar lymphadenopathy. Lateral chest-X Ray showed pre tracheal lymph node involvement, and abdominal USG showed reactive abdominal lymphadenopathy. We identified the condition as a probable case of Bazin's nodules (post-TB Erythema Induratum). We performed CT thorax to confirm the case, which revealed multiple reactive axillary lymph nodes on the left, the largest being 17x13mm in size. Gastric lavage for Gene Expert was negative.

Anti-TB Treatment (Category-1: INH-10 mg/kg, Rifampicin-15 mg/kg, Pyrazinamide-35 mg/kg, Ethambutol-20mg/kg) were started in view of the positive Mantoux test of 18mm. The nodule on the left elbow that had formed 15 days before the admission was resolved within 2 days of starting ATT. No fresh nodules appeared since the initiation of TB treatment, and the child completed 6 months of ATT treatment compliantly.



Fig.1 Subcutaneous nodules on right elbow (extensor aspect)

## DISCUSSION

The actual prevalence of post-TB EIB is unknown, as most go undiagnosed/ misdiagnosed. EIB is quite common and comprises 12.7 to 86 percent of cutaneous tuberculosis cases in South Africa and Hong Kong<sup>(4,5,6)</sup>.

EIB mainly presents in adult women and is rare among children worldwide. However, the above-described case suggests the increasing incidence of cutaneous manifestations of tuberculosis in the pediatric population as well.

A similar case was noted in China, of a 12-year-old girl with chronic lesions of erythema nodosum and no other symptoms. A positive tuberculin skin test (20 mm) later established the diagnosis of EIB (7). The point of similarity in all these cases is a positive Tuberculin skin test with no evidence of TB or any lung disease in chest radiographic reports, and negative Mycobacterium cultures as well.

Interferon- $\gamma$  release assay and Mantoux test done in these patients supported the initiation of anti-TB treatment (8).

The relation between EIB and TB is so common in the adult population that many authors and physicians advocate Anti-TB Treatment with Isoniazid, Rifampin, Pyrazinamide and Ethambutol in EIB, irrespective of any association to TB. Schneider and his colleagues started 20 patients with EIB on Anti-TB regimen, and all the cases fully recovered within 6 months with only 5 cases positive in PCR results (9). We should monitor such patients for the side effects of TB treatment, especially among the patients with negative PCR results.

In addition, the clinical features of EIB in children differ vastly from those of adults. Instead of the violaceous lesions and ulcers, swollen subcutaneous nodules with joint pain are often the first signs, as in the above-described case where the only symptoms were a joint pain in the knees and a papular rash on the extensor aspect of the elbow. There is a close resemblance of these symptoms to other diseases like the subcutaneous nodules of Rheumatoid Arthritis, Acute Rheumatic fever. Such cases are likely to be misdiagnosed as other diseases and treated with a cocktail of drugs without resolution. Thus, there is an increasing need to rule out TB earlier in the diagnostic process with the help of TST, in order to prevent misdiagnosis and under treatment. This makes the need for a prior Mantoux test in cases of swollen subcutaneous nodules with joint pain even more important.

Therefore, in every pediatric case of swollen subcutaneous nodules with joint pain, the Mantoux test should be performed, along with other diagnostic investigations, to diagnose TB (high incidence in developing countries). The direction of treatment can be clearer if TB is out of the picture. This will not only help in the early diagnosis and management of such cases but also prevent misdiagnosis and undertreatment.

## LIMITATIONS

The extra pulmonary symptoms of TB are often unspecific; cases of EIB often present as joint pain. This lack of specificity often hinders early diagnosis in most cases, or worse, misdiagnosed and treated as a different disease altogether, leading to worse outcomes in the future. The other uncommon presenting features of extra pulmonary TB remain understudied.

Additional research needs to be done towards identifying such cases, for better understanding of the disease, which remains a mystery so far.

Patients who present with EIB are usually young and middle-aged women. They come with recurrent occurrences of violaceous nodules or chronic, deep plaques on the leg. These cold lesions are painless and sometimes ulcerate centrally. Later, the overlying skin desquamates over the ulcer to form a scaly collarette around the lesion <sup>(10)</sup>. However, the clinical presentation of EIB in this child was just pain. This depicts the difference in the pattern of presentation of Erythema Induratum of Bazin (EIB) among different age groups.

The histopathologic correlation remains to be established, as no biopsy of the area was performed in this case because of different clinical presentations. This child was treated with anti-TB drugs based on a strong positive reaction to the tuberculin skin test (TST). In some Asian countries, the TST is not applicable as prior BCG vaccination often gives false-positive results. IFN-gamma assay could be used in such scenarios <sup>(11)</sup>.

## CONCLUSION

In a pediatric population, non-specific symptoms like joint pain with subcutaneous nodules direct towards a myriad of possible diagnoses, all of which require a different treatment. EIB is one of those probable diseases. Despite a low incidence of latent TB infection, Asians and other developing countries have a higher TB rate. Thus, EIB as a cause should be considered in children presenting with nodular inflammation, especially from Asian and developing countries <sup>(12)</sup>.

Including a minimally invasive, rapid, easy-to-perform diagnostic test like the Mantoux test will help in ruling out TB beforehand. Interferon- $\gamma$  release assays might be useful to support diagnosis of EIB, especially in a setting of prior BCG exposure <sup>(13)</sup>. Other tests like Chest X-ray, CT thorax, USG Abdomen, gastric lavage for bacteriological confirmation of Pulmonary or extra pulmonary Tuberculosis should be done. This will further provide a clearer approach towards other causes, especially in developing countries.

This little step could help in the early diagnosis and better management of such diseases among kids. It will further prevent them from developing severe complications because of under diagnosis, the need for prolonged TB treatments and related side-effects.

## REFERENCES

1. World Health Organization. Global tuberculosis report 2019. [https://www.who.int/tb/publications/global\\_report/en/](https://www.who.int/tb/publications/global_report/en/)
2. Cutaneous Tuberculosis: A great imitator, QiquanChenMD, PhD, WenChieh Chen MD, FeiHaoMD, PhD.
3. Chang, M.W., Lawrence, R. and Orlow, S.J., 1999. Erythema induratum of Bazin in an infant. *Pediatrics*, 103(2), pp.498-499.
4. Ho CK, Ho MH, Chong LY. Cutaneous tuberculosis in Hong Kong: an update. *Hong Kong Med J*. 2006 Aug;12(4):272-7.
5. Visser AJ, Heyl T. Skin tuberculosis as seen at Ga-Rankuwa Hospital. *Clin Exp Dermatol*. 1993 Nov;18(6):507-15.
6. Ho MH, Ho CK, Chong LY. Atypical mycobacterial cutaneous infections in Hong Kong: 10year retrospective study. *Hong Kong Med J*. 2006 Feb;12(1):21-6.
7. CC, A.C. and MI, B.C., 2012. Erythema induratum of Bazin associated to Mycobacterium tuberculosis infection. *Archivos argentinos de pediatria*, 110(3), pp.e43-6.
8. án Vera-Kellet, C., Peters, L., Elwood, K. and Dutz, J.P., 2011. Usefulness of Interferon- $\gamma$  release assays in the diagnosis of erythema induratum. *Archives of dermatology*,
9. Mascaró Jr, J.M. and Baselga, E., 2008. Erythema induratum of Bazin. *Dermatologic clinics*, 26(4), pp.439-445
10. Rademaker, M., Lowe, D.G. and Munro, D.D., 1989. Erythema induratum (Bazin's disease). *Journal of the American Academy of Dermatology*, 21(4), pp.740-745.

11. Na SY, Park SY, Cho HH, et al. Application of IFN-gamma releasing assay for the diagnosis of erythema induratum of Bazin. *J Eur Acad Dermatol Venereol.* 2014;28(1):41-45
12. Lee, Y.S., Lee, J.H., Choi, J.E., Kim, J.Y. and Han, T.Y., 2021. Erythema induratum of Bazin in a 10-year-old boy. *Pediatric Dermatology*, 38(1), pp.290-291.
13. án Vera-Kellet, C., Peters, L., Elwood, K. and Dutz, J.P., 2011. Usefulness of Interferon- $\gamma$  release assays in the diagnosis of erythema induratum. *Archives of dermatology*, 147(8), pp.949952.