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RESEARCH ARTICLE

SOLITARY INTRAMUSCULAR CYSTICERCOSIS OF RIGHT ELBOW REGION

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Abstract

Cysticercosis and Taeniasis are two conditions that tapeworms can transmit to humans. Cysticerci can be contracted by eating pork meat or eating eggs with tainted water. Cystocercosis of the muscles typically has no symptoms. Once the infection has been identified, it is critical to screen out intra-ocular and intra-cranial involvement since involuting cysticercus causes a strong inflammatory response that, if not discovered and treated promptly, can result in blindness. Controlling fecal contamination of water and food requires proper sanitation and personal hygiene. Food that is raw or inadequately cooked should be avoided, especially in endemic areas. A crucial component of treatment is conservative treatment with medicines. Surgical intervention is reserved for instances that do not react to conservative treatment and do not provide symptomatic relief. In our case, after establishing the diagnosis with ultrasound and magnetic resonance imaging, albendazole was administered as treatment and the definite diagnosis was made. In conclusion, although isolated soft tissue cysticercosis is difficult to identify most of the time, especially when it is not accompanied by central nervous system infection, if larvae can be demonstrated with any imaging modalities, cysticercosis can be easily diagnosed without further differential diagnosis.

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Introduction:-

Taeniasis and cysticercosis are two conditions that tapeworms can transmit to humans. An intestinal infection known as taeniasis is brought on by adult Taenia solium and Taenia saginata. Humans who are infected with encysted larvae (cysticercus cellulosae) of the tapeworm Taenia solium develop soft tissue cysticercosis. **[1].**

The central nervous system, subcutaneous tissue, skeletal muscle, cardiac muscle, and the eye are predisposed locations for the formation of cysticerci. Neurocysticercosis is by far the most prevalent kind of systemic involvement. 13%-46% of systemic illness is caused by ocular and adnexal cysticercosis. **[2].**

We present a case of cysticercosis with a muscle component that manifested as acute swelling and discomfort and was treated conservatively.

Case Report

A 30 year-old girl presented to us with complaints of acute onset pain and swelling at right lower third of arm extending to elbow region. The swelling was gradually increasing in size for the last 1 week. There was stiffness at

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elbow, unable to do activity of daily living (ADL) with right upper limb. There was no history of fever, trauma, massage to right elbow region. There were no visual disturbances, no diplopia, no episode of seizure disorder and vomiting, no history of skin rashes, and no history of worm infestation. There was no history of convulsion or any neurological symptom. On examination, there was diffuse swelling and tenderness at anterior aspect of lower arm and extending to elbow. Local temp minimally rose. There was fixed flexion deformity of 20 and further flexion possible up to 90 but was painful. We had differential diagnosis like infective or neoplastic lesion. We subjected patient for ultrasound arm and elbow in addition to MRI. Both were suggestive of cystocercosis. We gave plaster slab for immobilization to reduce pain Infectious disease specialist and neurologist were consulted. MRI scan for brain done in addition to PET scan was done to rule out any additional lesion elsewhere. There was no lesion at brain or orbit or any other site other than right elbow. We started treatment with Tab Albendazole 400 mg Bid for 21 days. Also gave steroids and NSAIDS to counteract inflammatory response and to reduce pain.

Discussion:-

Ingestion of the harmful cysticerci found in undercooked pork meat or consumption of eggs found in tainted water, food, or vegetables are the two main ways to contract cysticercosis. As a result of rural society, population density, and poor sanitation, there is a high incidence of tapeworm infection in developing nations, where there is also a higher risk of feces contaminating food and water due to increased human-pig contact. **[3].** In the life cycle of cysticerci, humans are the intermediate hosts. A family history of parasitic infestation, past travel to an endemic region, or visitors from an endemic region to the home are risk factors. In tropical regions like Sub-Saharan Africa, India, and East Asia, cysticercosis is endemic. There is no particular sex preference. Any age group could be affected.

The patient with cysticercosis typically exhibits no symptoms at all. The serious symptoms that occur most frequently are neurological. Despite being frequent, muscle involvement usually has no symptoms. But isolated soft tissue cysticercosis is uncommon **[4], [5]**.

The total number and allocation of cysticerci, as well as the degree of associated inflammation, all influence the clinical symptoms of cysticercosis. The organism most frequently affects the heart, skeletal muscles, subcutaneous tissue, eyes, and central nervous system, but it can also occasionally affect the lungs, liver, and kidney. Cysticercosis of the muscles typically has no symptoms. Three different clinical manifestations of the muscular form have been identified: the myalgic type, the mass-like, pseudotumor, or abscess-like type, and the uncommon pseudohypertrophic type **[6], [7]**.

An immunologic reaction with moderate to severe inflammatory signs and symptoms may occur, and the surrounding structures may be compressed. The parasite's death generates a significant release of toxic chemicals, resulting in a severe inflammatory response in muscle and soft tissues. In our situation, the patient presented with a swelling of the front aspect of the right arm and elbow, as well as trouble working with the right upper limb. Imaging studies are the most useful in determining the presence of cysticercosis. The musculoskeletal cyst can be detected with high-resolution ultrasonography (USG), computed tomography (CT), and magnetic resonance imaging (MRI). USG reveals a well-defined cystic lesion with clear contents and a hyper echoic region suggestive of a scolex **[8]**. On CT scan, the distinguishing feature is a hypodense mass with a central hyperdensity, indicating a scolex. An MRI indicates a hypointense cystic lesion and a hyperintense scolex within the muscle. There have only been a few cases of muscle cysticercosis diagnosed with ultrasonography and MRI. We have identified the intermuscular cysticercosis, which showed clinically as elbow swelling, with the aid of high resolution ultrasonography. The scolex of the cysticercus is represented by the hyper echoic structure within the cystic lesion. Living cysticerci aggressively avoid immune recognition and do not induce inflammation; but, following larval death, fluid leakage from the cysts may cause an acute inflammatory reaction. This inflammatory process may manifest as a circumferential hypoechoic lesion in the muscle, causing local discomfort and myalgia. The cysticercus cyst with an inflammatory mass surrounding it, caused by the death of the larva, is one of the sonographic manifestations of cysticercosis.

The intermuscular cysticercosis, which showed clinically as swelling in the thigh, has been identified with the aid of high resolution sonography. The cystic lesion's hyper echoic structure matches to the cysticercus's scolex. Living cysticerci aggressively avoid immune detection and do not induce inflammation; but, when larvae die, fluid from the cysts may leak out and cause an acute inflammatory reaction. This inflammatory reaction may manifest as a circumferential hypoechoic lesion in the muscle, causing local discomfort and myalgia. The cysticercus cyst with an

inflammatory mass surrounding it as a result of the larva's death is one of the sonographic manifestations of cysticercosis. The second sort of cyst is an uneven cyst with very little fluid on one side, indicating fluid leaking. The scolex's eccentric echogenic protrusion from the wall is not visible within the cyst. It could be due to scolex escape from the cyst or partial cyst collapse, as shown in our instance. The third clinical presentation is a big irregular accumulation of exudative fluid within the muscle, with a characteristic cysticercus cyst containing the scolex located eccentrically within the collection.

This could be attributed to chronic intermittent fluid leakage from the cyst, resulting in florid inflammatory exudates. This appearance is similar to that of an intramuscular abscess, but the presence of a cysticercus cyst within it confirms the diagnosis. The cysticercus itself, which appears as an oval or circular well-defined cystic lesion with an eccentric echogenic scolex in it, is the distinguishing feature in all three of these sorts of presentations. Calcified cysticercosis is the fourth sonographic appearance. It appears on plain radiography as many elliptical calcifications in soft tissue, similar to the pathognomonic millet seed-shaped elliptical calcifications in soft tissues.

As Vijayaraghvan and Mittal shown, the cysticercus is an irregular cyst with leaking echogenic scolex and surrounding inflammatory phlegmon in the right vastus medialis muscle **[6], [7], [9]**.

Sonography is not generally employed in the diagnosis of muscle cysticercosis; however, with the advent of high resolution sonography, it can be used liberally, as was done in our case **[10], [11]**. Sonography reveals an elliptical cystic lesion, which is a fluid-filled, bladder-like structure containing the larva **[6], [7]**.

Soft tissue cysticercosis is difficult to diagnose due to the vague clinical signs; a history of residence or travel in an endemic location, or the presence of infected animals in a patient's environment, can sometimes aid. Plain radiographs rarely show cysticerci, unless they calcify in later cases **[12]**. Multiple, elongated, calcified cysts 10-15 mm long, 2-3 mm wide, and aligned in the direction of muscle fibers can be detected on plain films. The cystic nature of the lesion is shown by ultrasound. Furthermore, using Ultra Sound, the larvae can be visualized; in later stages of infestation, the granulomatous inflammatory process that happens after the larvae's death can also be detected. A review of the literature indicated that no instance of human cysticercosis has been documented in which the diagnosis could be made purely on the basis of peripheral enhancement; later, peripherally enhancing cystic lesions are identified, indicating the inflammatory reaction that happens after the parasite's death**[13][14]**. Contrast was not used in our case because magnetic resonance imaging was performed to illustrate the relationship of the lesion to neighbouring muscle groups rather than to detect the stage of infestation. Excisional surgery or needle or open biopsy can be used to provide a conclusive diagnosis of soft tissue cysticercosis. The presence of the typical scolex, with four suckers and a double row of hooks, is required for a definite diagnosis.

Positive test results for anticysticercal antibodies from a serum enzyme-linked immunosorbent assay assist confirm the diagnosis in cases when scolex is not evident; nevertheless, negative test results do not rule out cysticercosis. Eosinophilia is linked with a high diagnostic value.

The mainstay of treatment is medical therapy. The larvicidal medications albendazole and praziquantel are used to treat cysticercosis in humans **[15]**. Once orbital cysticercus has been confirmed, it is critical to rule out central nervous system involvement. Dying cysticercus releases its poison, causing a strong inflammatory response that leads to vitritis. This can result in blindness. As a result, checking for intraocular involvement of cysticercus cyst is required. Albendazole is typically administered at a dose of 15 mg/kg/day, with a maximum dose of 400 mg/bid (higher doses have been used), with repeated dosing as clinically indicated. As the cyst involutes, treatment may promote inflammation, aggravating clinical conditions. To avoid an inflammatory response, corticosteroids should be administered concurrently. This normally happens 2-5 days after starting therapy. The surgical excision of the cysticercus is the most effective treatment for intramuscular cysticercosis.

In our case, the cysticercus was proven to be an irregular cyst with leaking echogenic scolex and surrounding inflammatory phlegmon, comparable to the right vastus medialis muscle, as Vijayaraghvan and Mittal demonstrated **[6][16]**.

Localized lesions that cause noticeable symptoms should be surgically removed. Anti-helminthic medications such as praziquantel or albendazole have been advised for neurocysticercosis and subcutaneous cysticercosis **[10][16]**. We managed the patient conservatively, using only albendazole and steroids. Albendazole, as a vermicidal, produces

degenerative changes in the worm's tegument and intestinal cells by binding to tubulin's colchicine sensitive region and preventing its polymerization or assembly into microtubules. The loss of cytoplasmic microtubules limits glucose intake in the larval and adult stages of vulnerable parasites, depleting their glycogen stores and decreasing adenosine triphosphate generation, resulting in parasite immobilization and death. Steroids are utilized as anti-inflammatory agents since most phlegmon is an inflammatory reaction to the cyst.

Figure:

Figure 1:- Ultrasound Image of Right Elbow Showing Scolex On Presentation.

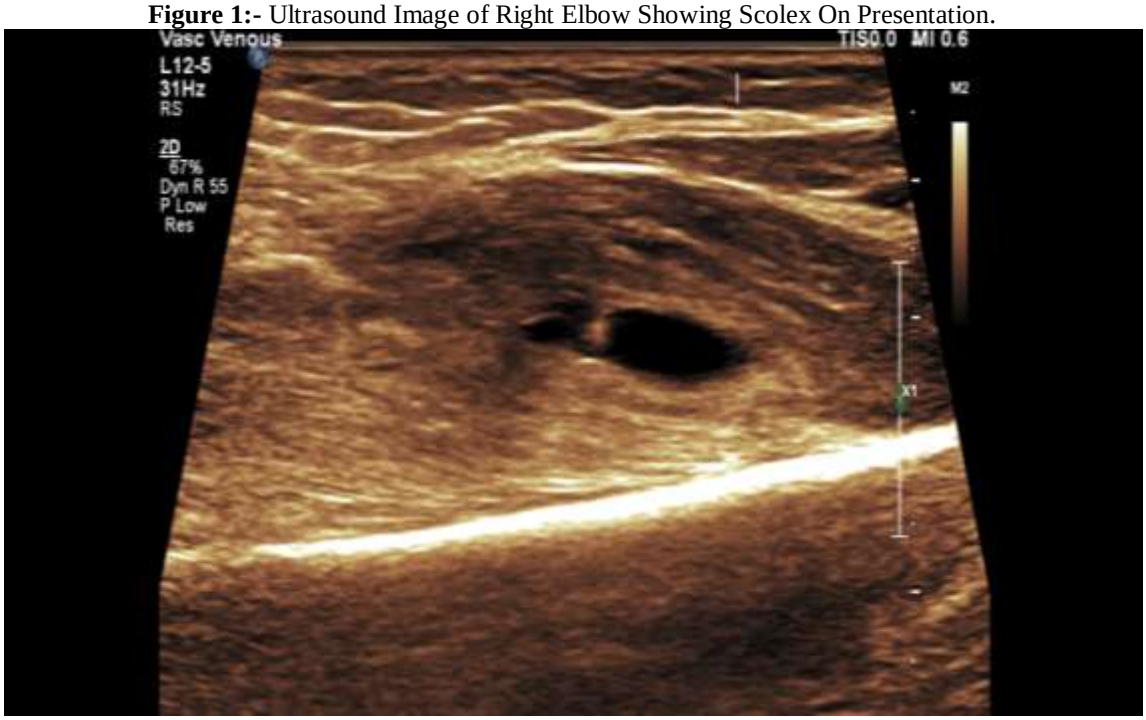


Figure 2:- Ultrasound Image of Right Elbow Showing Scolex.

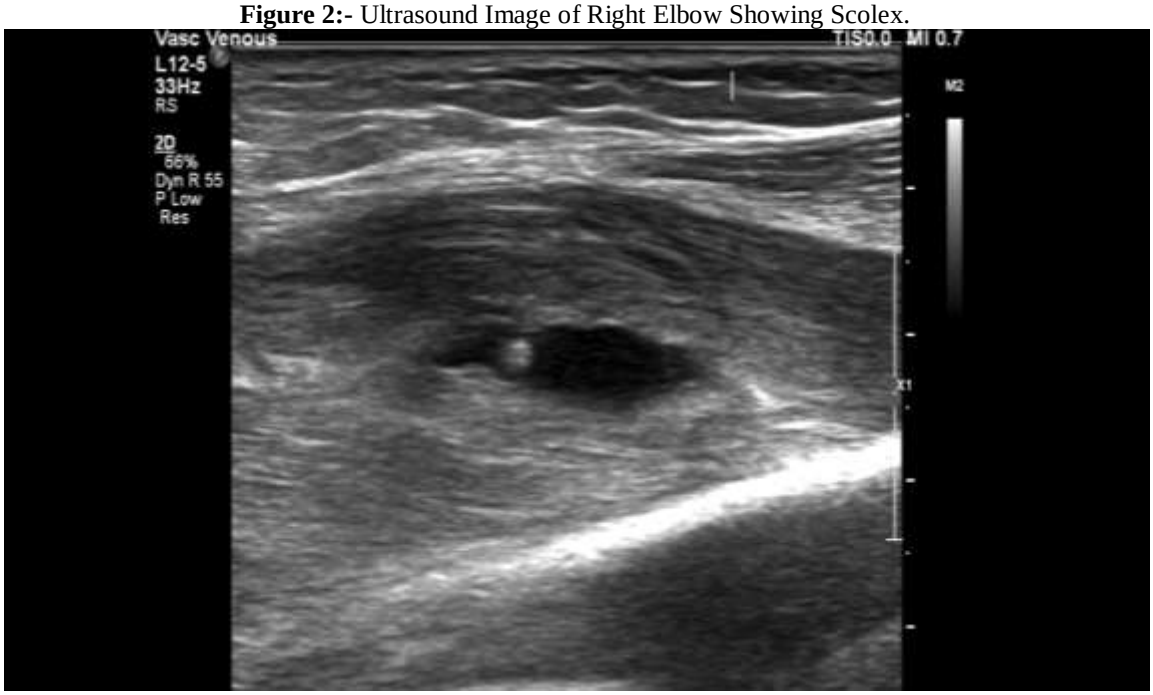


Figure 3:- Ultrasound Image of Right Elbow Showing Resolving Lesion After 3 Weeks Of Treatment.

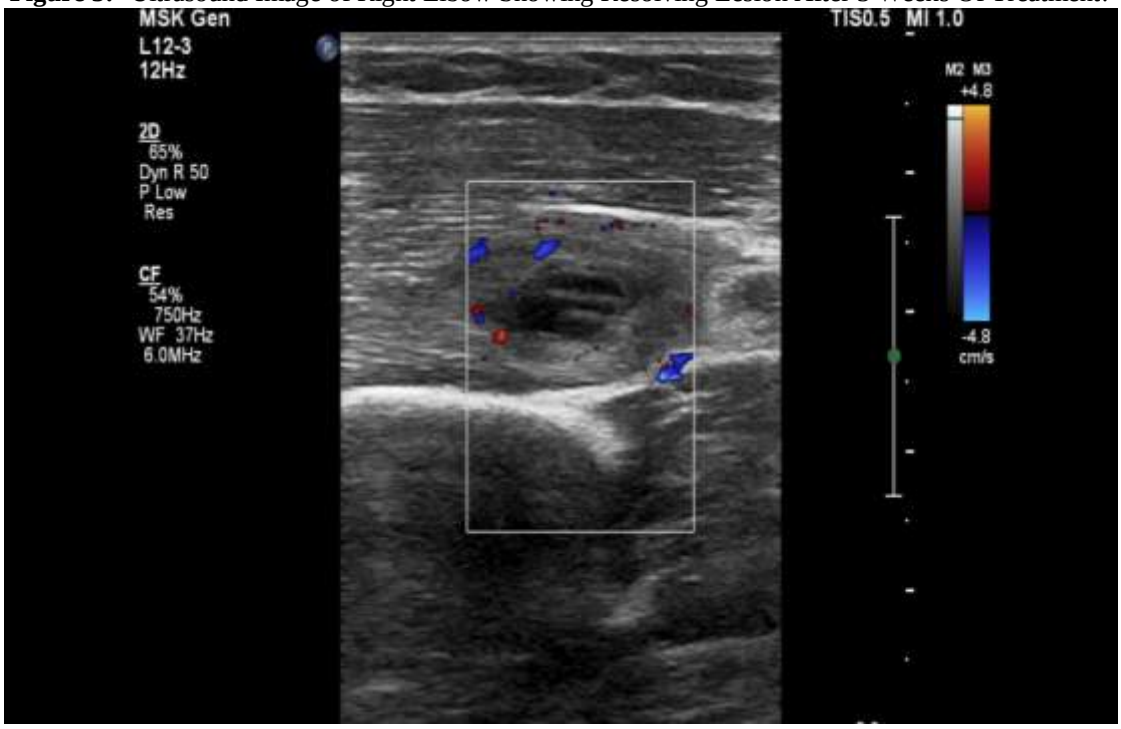
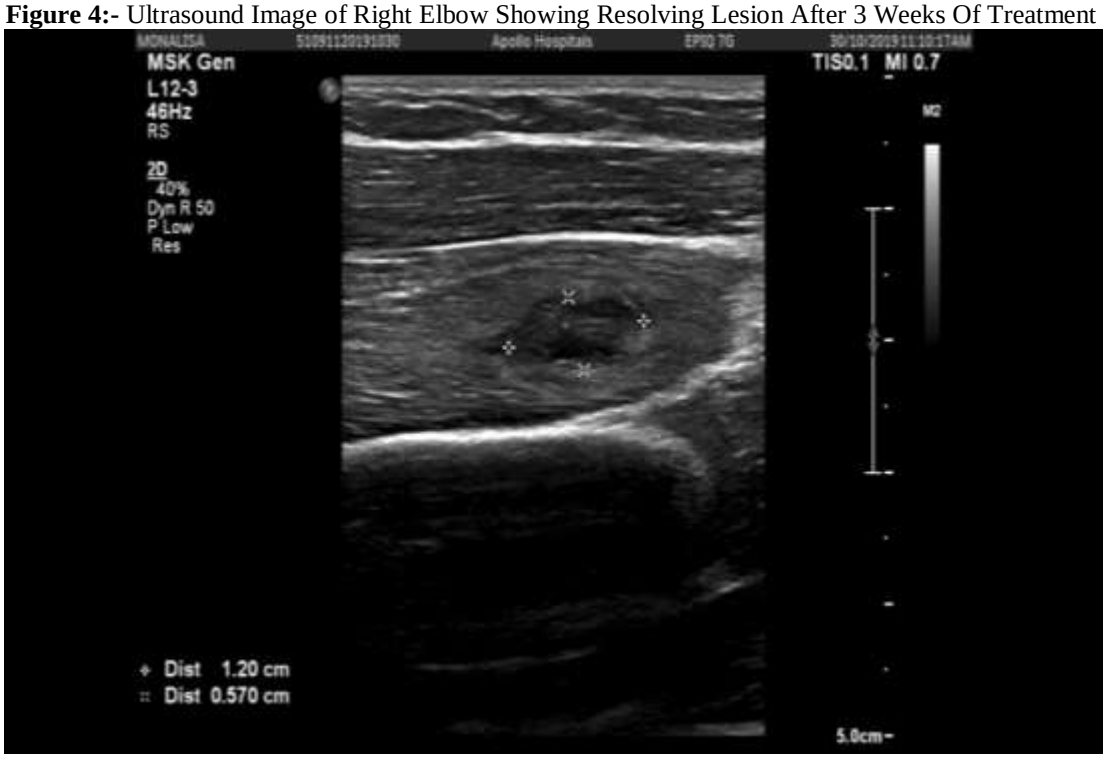


Figure 4:- Ultrasound Image of Right Elbow Showing Resolving Lesion After 3 Weeks Of Treatment



Mri Images

Figure 5:- MRI Image of Right Elbow Showing Lesion At Distal Humerus Region.

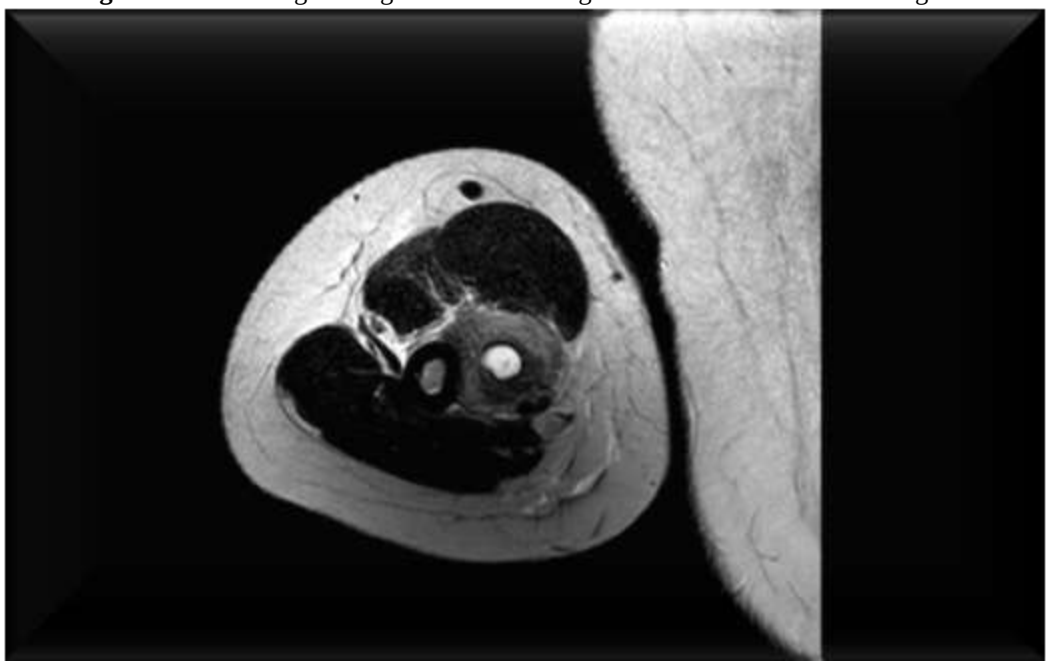
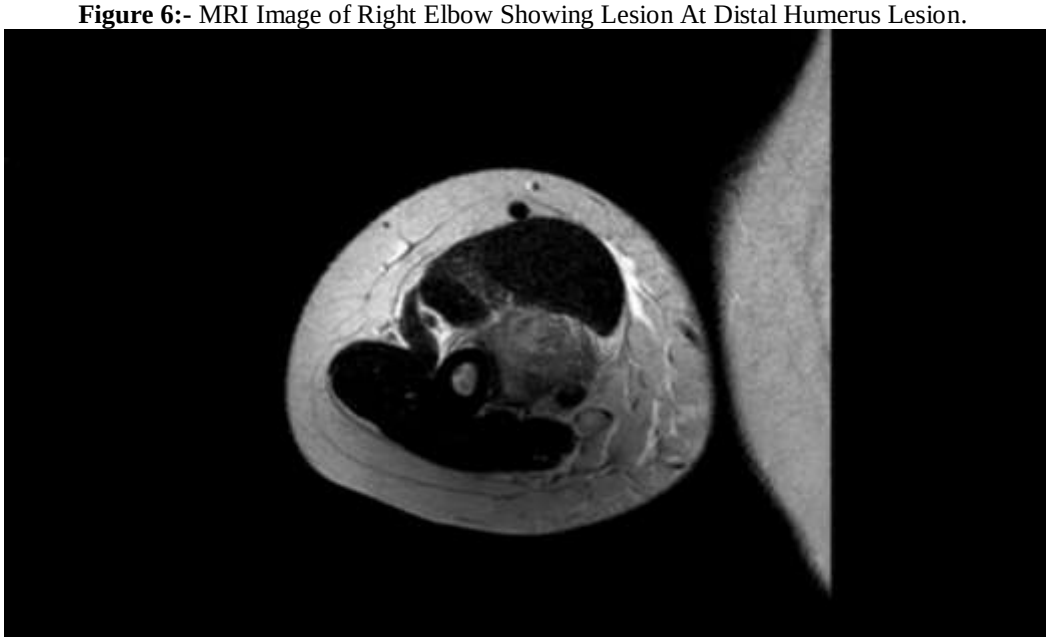


Figure 6:- MRI Image of Right Elbow Showing Lesion At Distal Humerus Lesion.



Conclusion:-

In endemic areas, cysticercosis should always be considered as a differential diagnosis for all types of subcutaneous swellings. Because it is non-invasive and nonionizing, high-resolution sonography is useful in establishing a diagnosis in patients with muscle cysticercosis. In the underdeveloped world, musculoskeletal cysticercosis is a prevalent clinical disease. It has a wide range of clinical manifestations depending on the place of lodgement. Once the infection has been identified, it is critical to screen out intra-ocular and intra-cranial involvement since involuting cysticercus causes a strong inflammatory response that, if not discovered and treated promptly, can result in blindness.

Controlling fecal contamination of water and food requires proper sanitation and personal hygiene. Food that is raw or inadequately cooked should be avoided, especially in endemic areas.

A crucial component of treatment is conservative treatment with medicines and a local supportive plaster slab. Surgical intervention is reserved for instances that do not react to conservative treatment and do not provide symptomatic relief.

In our case, after establishing the diagnosis with ultrasound and magnetic resonance imaging, albendazole was administered as treatment and the definite diagnosis was made. In conclusion, although isolated soft tissue cysticercosis is difficult to identify most of the time, especially when it is not accompanied by central nervous system infection, if larvae can be demonstrated with any imaging modalities, cysticercosis can be easily diagnosed without further differential diagnosis.

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Conflicts of interest:
There are no conflicts of interest.

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