

CURRENT AND EMERGING TREATMENT FOR LIPOMA**S. D. Rihana*, T. Neelima, N. Divya, Y. Dedeepya, G. Jahnavi and R. Sudheer Babu**

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Article Received on
12 Dec. 2018,Revised on 01 Jan. 2019,
Accepted on 22 Jan. 2019

DOI: 10.20959/wjpr20192-14117

Corresponding Author*S. D. Rihana**Nalanda Institute of
Pharmaceutical Sciences.**ABSTRACT**

Lipomas are accumulation of fatty tissue between the skin layer and the muscle. These are mainly origin at mesenchymal region. Lipoma occurs at all age groups and mainly at 40-60 years old. Lipoma tumor frequently develops, where fatty tissue are predominant. Lipoma occurs at anywhere in the body and is mainly appears at cerebral, thorax, shoulder and spine. lipomas are rarely settled at the foot. Lipoma are slowly enhancing when these are called as benign. Lipoma over 2cm maybe cause anemia. It is soft and no pain at all doughy like masses. Lipomas are inheritance and run through families rarely

lipomas along with syndromes like familial multiple lipomata's, Adipose dolorosa, Cowden disease, familial adenomatous polyposis and Madelung's disorder. lipoma consist of many types like angioliipoma, conventional type, Hibernia, Fibromyalgia, Myelolipoma, spindle cell lipomas [SCL], Pleomorphic lipomas, this disease is usually left alone without any treatment. But if lipoma grow more than 5cm therapy should required. More therapy options stars at steroidal injections up to excision is available.

KEYWORDS: Adipose dolorosa, Cowden syndrome, gardeners syndrome, Madelung's disease, multiple lipomata's.

INTRODUCTION

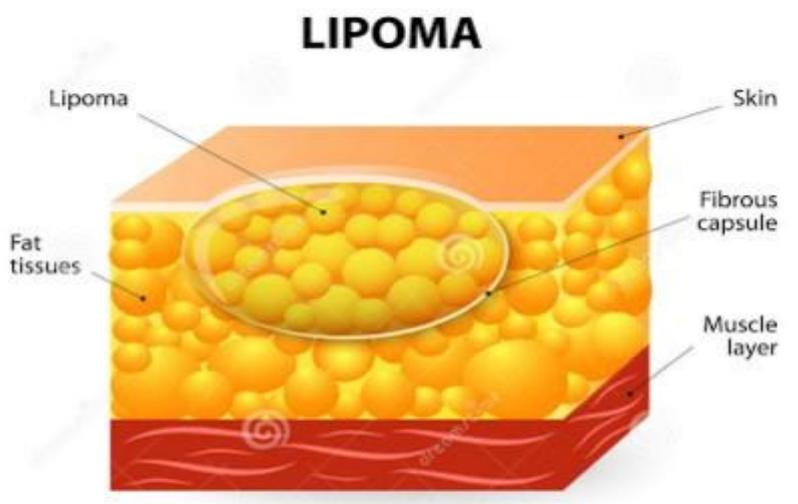
A fatty lump that is formed between the skin and the underlying muscle layer is called lipoma. It is also known as benign tumor made up of fat It is a slow growing. Enclosed by a thin, fibrous capsule it is mostly seen in middle aged people. Lipoma is not always harmful but rarely it is dangerous. A lipoma can form on any part of the body. But they are mostly seen on:

- Back
- Neck

- Shoulders
- Arms
- Legs

Lipoma of the CNS can be located inside the cranium or the spinal canal. they are usually found in the midline in the interhemispheric fissure(40-50%), the suprasellar region (15-20%), the pineal region(25%). Lipoma can also be detected in the sub arachnoids cisterns and occasionally in the jugular foramen or the foramen magnum.

Once lipoma is formed it will not change and will have a very little potential for being cancerous. Lipoma is benign and they have many histologic sub types.



Types

Lipomas are classified according to their appearance under the microscope. They are

- **Conventional lipoma:** it is also known as classic type lipoma. It is a benign tumor composed of lobules of mature adipocytes, that arises within the subcutaneous tissue, deep soft tissues. It consists of well encapsulated mass of mature adipocytes. It most commonly occurs on the superficial tissues of the proximal limbs and trunk.
- **Hibernoma:** it is a rare benign tumor arising from the fetal brown adipose tissues. On MRI it can be look like a malignant tumor. Symptoms of Hibernoma include slow-growing, painless, solitary mass, usually of the subcutaneous tissues. It also occurs rarely in intramuscular tissue. It can be diagnosed by imaging findings, pathology findings.
- **Fibrolipoma:** The lipoma containing excess of fibrous tissues.

- **Angiolipoma:** It is the growth of fat and blood vessels under the skin. These are painful. They occur mostly on fore arms, trunk, upper arms, neck, and legs. They may run in families. They may also be caused by certain medical conditions. They are diagnosed by biopsy, MRI and CT scan.
- **Myelolipoma:** These are the tumors of adrenal gland composed of adipose tissues and hematopoietic cells. Symptoms include pain in the abdomen, blood in the urine, a palpable lump or high blood pressure. They are diagnosed by CT scan, ultrasound and MRI.
- **Spindle cell lipoma:** These arise from the subcutaneous tissues of the upper back, posterior neck and shoulders in male. It is treated by local excision. Cytology, histology, and cytogenetics are the diagnostic tests for spindle cell lipoma.
- **Pleomorphic lipoma:** It is considered as a variant of spindle cell lipoma. It is a rare adipocytes neoplasm, occurs mostly in elder males in the subcutaneous tissues of the neck or shoulder.
- **Atypical lipoma:** It is considered as a low grade malignancy that rarely causes metastasis. They are the most prevalent and usually appear as asymptomatic softened tumors. They can develop on any part of the body, and are more commonly on thighs and arms. They are diagnosed by MRI scans X-rays and CT scans.
- **Intra muscular lipoma:** it is a benign subcutaneous mesenchymal neoplasm consists of fatty cells. It is caused due to the infiltration of the muscle or the synovial. It is a slow-growing tumor that can occur at any age, but most common at 40-70 age. They occur in the thigh, limb, shoulder and chest wall.
- **Retroperitoneal lipoma:** they are rare and their incidence is unknown.

Causes

The causes of lipoma are not well determined, but some of the well known causes are:

Family history	Genetically factors
Age	Gardener syndrome
Physical trauma	Adipose dolorosa
Inherited conditions	Familial multiple lipomata's
Alcohol	Cowden syndrome

Symptoms

Lipoma usually appears as small soft lumps. They are usually less than 2 inches wide. They feel like doughy. Sometimes more than one appears on the body. They are senseless, but

when touched it may cause pain. A person with a lipoma will typically feel a soft, oval shaped lump just beneath the skin. They are usually pain less unless they affect blood vessels against nerves or blood vessels. However a deep lipoma may place pressure on internal organs or nerves and cause associated symptoms like nausea, vomiting and constipation.

Risk factors

The risk factors include

- Age between 40 and 60 years old
Although lipoma occur at any age they are most common at this age
- Genetics. Lipomas pass through families.
- Adipose dolorosa
- Cowden syndrome
- Madelung's disease
- Alcohol consumption.

Pathophysiology

The exact Pathophysiology of lipoma is not known but some traces shows that when a trauma formed in our body then edema and inflammation occurs. It leads to occurrence of non-encapsulated but visualized lesion along releasing more provocative agents induced by enhance vascular permeability. Perilesional striations and fibrosis occurs. Demarcated and simple lipoma is formed. Repetitive trauma, ongoing micro trauma, stress irritation, to the already existent space-occupying lesion it leads occurrence of atypical appearances at the and aggressive behavior it progress to malignity (lip sarcoma, lipoblastoma).

Malformative mechanism in lipoma was supported by its association with midline deformity of the CNS. These are mainly combined with malformation of the mid brain in the form of organization.

Lipomas is also formed due to fat deposition between the dermal and muscle layer. Deposition of fat leads to the genesis of lesions by grasping the neighboring fat producing cells. [IM] lipoma is normally poorly restricted and infiltrative.

Diagnosis

We can diagnose a lipoma by performing the physical examination. The lipoma is of soft and painless. Also the lipoma move easily when touched, since it is made up of fatty tissues.

Biopsy is the another test for the detection of lipoma. In this procedure small portions of the tissue is scraped and send it to the laboratory. This test is done to check the possibilities of cancer. MRI and CT scans are also done if the lipoma seems cancerous.

Complications

As the lipoma are not dangerous many left the lipoma as untreated. If the lipoma keeps on growing and left untreated then the complications may occur. Although the complications of lipoma are less, some of the complications of lipoma includes Myxomatous changes-occurs in retroperitoneal lipoma, Saponification, Calcification-11%mineralisation, Intussusception, Intestinal obstruction.

Treatment

Lipoma is generally harm less. Treatment is not required but when it is growing more than 5cm and when it cause pain treatment is required. Some people refer treatment for beauty purpose also.

Treatment includes

Natural treatment

Lipoma can be treated naturally. Natural treatment for lipoma includes:

1. **Turmeric:** turmeric helps in decreasing the size of lipoma and also helps to prevent recurrence. 1tsp of turmeric is mixed with olive oil to form a soft paste. This paste is applied on the site of the lipoma and the lipoma is covered with a bandage.
2. **Weight loss:** Deposition of fat or obesity is also known for the cause of lipoma. So consumption of diet that contains high fiber should be consumed. Meals that are prepared in home should be consumed. Consumption of sugar should be avoided which leads to the increase of fat in the body. Regular exercise can also helps in weight loss.
3. **Apple cider vinegar:** apple cider vinegar contains acetic acid which in reduction of fat deposition in the body. Consumption of apple cider vinegar daily reduces the lipoma.
4. **Castor oil:** castor oil also helps to decrease the lipoma. Cotton dipped in castor oil and massage it on the lipoma and cover it with a bandage. Leave it for overnight and clean the area with warm water next morning. Repeat it until the size is reduced.
5. **Garlic:** mix the garlic oil with olive oil and massage it on the lipoma for few minutes and clean it after 1 hour. Repeat it for 2or 3 times a day.
6. **Ginger:** ginger helps in reduction of size of lipoma. Ginger mixed with olive oil is applied on the site of lipoma, massage and rinse with water after few minutes.

7. **Avoid smoking:** quitting of smoking helps in reduction of lipoma. Because of smoking also lipoma may occur on multiple places of the body. The toxicants present in cigarettes increases the chance to get and increase the lipoma.
8. **Allover:** cut the Allover and peel off the skin. The gel is applied at the site of lipoma and cover it with bandage. After 2-3 hours remove the bandage and rinse with water. Repeat it until the lipoma is cured.

Non experimental methods

Cauterization

It involves using heat, by the aid of heat the segments of the tissues are burned. It is not widely used in removing subcutaneous lipoma, but it is extensively used in other areas of surgery. Several instruments are developed to deliver the heat to the tissues.

Electro surgery

Electro surgery is the appeal of radio frequency alternating polarity, electrical current to the biological tissue to cut, coagulate, and desiccate. By the use of this technique we are able to make precise cuts with limited blood loss. The monopole instrument called an active electrode, when we make it energized, requires the use of another monopole instrument called a dispersive electrode, anywhere in the patients body that functions to defocus the Rf current and prevent thermal injury to the underlying tissues. The bipolar instruments are designed with two active electrodes such as a forceps for sealing blood vessels. Complications of Electro surgery includes scarring, burns, interference with pacemakers and production of surgical smoke.

Harmonic scalpel

The harmonic scalpel is not as easily maneuverable as an electrosurgical instrument. It requires more time for cutting and coagulation of tissue. Unless like in Electro surgery, the harmonic scalpel only coagulates as its cuts, even though it takes more time it simultaneously cuts and coagulates.

Liposuction

Liposuction is typically performed as cosmetic procedure. It is used for the removal of small or large lipomata's growth. Complete elimination of lipoma is not possible with liposuction. During a typical liposuction several small incisions of 1cm are made at strategic locations. In wet liposuction, fluid is infused in order to loosen adipose tissue and reduce bleeding. Office

procedures involving the usage of 16gauge needle and a large syringe are safer than large cannula liposuction. Anesthetics are included to reduce the pain. Diluted Lidocaine is used as anesthesia in office procedure. Dry liposuction includes the removal of fat without injecting fluid to the surgical field. To create tunnels in the fat a smaller cannula 1mm, is first used and the diameter of the cannula is gradually increased and then employed to target fat. The most important step is the careful movement of the cannula. Deeper layers are targeted first and then the superficial layers. Different liposuction techniques are available in order to remove adipose tissues properly.

- **Conventional liposuction technique:** In this large incisions of 1-1.5cm are made near the targeted area. Then a large cannula of about 0.6-1cm in diameter is introduced into the subcutaneous layer to target adipose tissues. In this process the patient should be under general anesthesia. In this method the patient is required to be in hospital, because the large cannula and larger incisions makes this technique very effective.
- **Tumescent liposuction technique:** In this technique 4-8 small incisions of 1-3 mm are made at the targeted areas. 1-4L of Klein's fluid, composed of saline, diluted epinephrine and lidocaine are injected. Epinephrine causes vasoconstriction and lidocaine acts as general anesthesia. A micro cannula of 1.5-3cm is inserted to target adipose tissues. It is the only liposuction technique that requires local anesthesia. Hence hospital is not required. It is done at post operative recovery time.
- **Power-associated liposuction(PAL):** it is similar to the conventional liposuction. The only difference is that it involves the reciprocating cannula. This technique is mostly used in the lower surgical mobility areas such as umbilical and waist areas. PAL involves hospital and general anesthesia.
- **Ultrasound-assisted liposuction:** by the use of an ultrasound emitting probe, the ultrasound is incorporated which results in the destruction and removal of fat cells. This technique results in many side effects, such as burns, seromas and extended post operative swelling. It also increases the cost of the procedure due to the additional equipment.

The use of liposuction is rare because the treatment is expensive, due to the requirement of extensive training. The cost varies by the location and size of the tumor.

Lasers

These are the alternative technique for the removal of lipoma. Laser assisted lipoma removal is more of an experimental technique. Co2 lasers can be used for the tissue removal. They consists of infrared beam to excite water molecules in the targeted tissues. The intensity of the laser can be varied between 3-8W, which provides control and limited side effects.

Heat transfer from the laser and cauterized tissue can cause damage to the surrounding tissue. Lasers also can't be used alone because cauterized edges will not tend to heal together. They must be used in conjunction with traditional methods.

EXPERIMENTAL METHODS

Non-surgical chemical injections: FDA doesn't approved any injectable drugs for lipoma treatment. The mixture of phosphatide choline (PDC) and deoxycholate (DC) injection is commonly studied that has been proved to reduce the size of the lipoma. Other non surgical treatments for lipoma are steroid, statin and collagenous based formulations.

Phosphatidic choline/deoxycholate: phosphatide choline (PDC) is a cell membrane component. For the cosmetic reduction of the amount of local fat PDC is combined with DC in order to solubilize the formula; DC alone reduces the size of the lipoma. The PDC/DC combination reduces the higher size of lipoma than DC alone did. Side effects include bruising, edema, erythema and pruritus.

Steroid injections

Steroid injections help in shrinking the lipoma and results in removal of lipoma. These are preferred for the lipoma less than 1 inch. A one to one mixture of 1%lidocaine and triamcinolone actinide in a dosage of 10mg/ml is injected in to the center of the lesion. The dose of the steroids and number of injections depends on the size of the lesion and response of the patient. The maximum dose is 1-3ml and the injections are repeated several times at monthly intervals.

The β_2 agonist isoproterenol was used in combination with prednisolone to stimulate adipose tissues which causes local lipolysis. The β_2 adrenergic receptor stimulation is important to lipolysis because the release of glycerol is reduced which is also observed in extended periods of aerobic exercise. The 50% reduction of size of lipoma is achieved by the effective concentration of isoproterenol.

Collagenases

The Collagenases based injections are designed to eliminate the fatty tissues of a lipoma. Collagenase clostridium histolytic is the drug used in this technique. Treatment of lipoma with this injection may dissolve the collagen/fibrous strands and thus reduces the size of lipoma.

Combination technologies

Many of the techniques are applied along with the other to achieve better results in lipoma extraction. Some of them are:

- **Liposuction procedure with ultrasonic probe:** ultrasonic assisted liposuction(UAL) uses either a metal probe or metal paddle to insert ultrasonic energy and heat in to subcutaneous fat. Internal UAL is the term that describes the technique in which hollow metal probe is inserted in to fat through a large incision. External UAL requires the use of tumescent fluid and metal paddle applied on the skin and allows ultrasonic energy in to subcutaneous fat.
- **Laser assisted liposuction method and apparatus:** this technique utilizes liposuction cannula which contain a water source, laser source and a suction source. This releases water in to an active area within the cannula, and directs laser energy within the molecule. This raises the water temperature. This water molecule escapes from the active area of the cannula in to the surrounding fatty tissues. The water molecule braes the fat molecule and helps in removal of fat.

Enucleating

Lipomas of 3-4mm are removed by this method. A curette is placed inside the lesion and is made free from other tissues. Then the tumor is enucleated. Sutures are generally not required but a pressure dressing is applied to prevent the formation of hematoma.

Excision

Large lipoma are removed by this method. In this method a small incision is made on the region where the lipoma is present. The central part of the lipoma is to be excised by grasping with a hemostat, which is used to provide grip for the removal of the tumor. Dissection is then performed beneath the skin and the tumor is dissected from the surrounding tissue with the help of scissors or scalpel.

Once the lipoma is dissected the hemostats can be attached to the tumor to provide grip for the removal of the remaining growth. Then the lipoma is completely removed. After the removal the incision is closed with the 4-0or-0 nylon sutures. a pressure dressing is placed to avoid the formation of hematoma.

CONCLUSION

It is important to preoperatively distinguish the simple lipoma from major lip sarcomas because of the difference in treatment, prognosis, and long term follow-up. To differentiate lip sarcomas MRI is mainly used. A histological examination is conducted after the removal of lipoma for the conformation of the total removal of lipoma, as the traces may regenerate.

REFERENCES

1. Dei Tos AP. liposarcoma: new entities and evolving concepts. *Ann Diagn Pathol*, 2000; 4: 252-266.
2. Evans HL, Soule EH, Winkelmann Rk. Atypical lipoma, atypical intramuscular lipoma, and well-differentiated retroperitoneal liposarcoma: a reappraisal of 30 cases formerly classified as well-differentiated liposarcoma, *cancer*, 1979; 43: 574-584.
3. Lucas DR, Nascimento AG, Sanjay BK, Rock MG. Well-differentiated liposarcoma: the Mayo Clinic experience with 58 cases. *Am J Clin Pathol*, 1994; 102: 677-683.
4. Rozental TD, Khoury LD, Donthineni-Rao R, Lacman RD. Atypical lipomatous masses of the extremities: outcome of surgical treatment. *Clin Orthop*, 2002; 398: 203-211.
5. Weiss SW, Rao VK. Well-differentiated liposarcoma (atypical lipoma) of deep soft tissue of the extremities, retroperitoneum, and miscellaneous sites: a follow –up study of 92 cases with analysis of the incidence of dedifferentiation. *AmJ Surg Pathol*, 1992; 16: 1051-1058.
6. Galant J, Marti-Bonmati L, Saez F, Soler R, Alcalá-santaella R, Navarro M, The value of fat-suppressed T2 or STIR sequences in distinguishing lipoma from well-differentiated liposarcoma, *Eur Radiol*, 2003; 13: 337-343.
7. Hosono M, Kobayashi H, Fujimoto R, et al. septum-like structures in lipoma and liposarcoma: MR imaging and pathologic correlation. *Skeletal Radiol*, 1997; 26: 150-154.
8. Jelinek JS, Kransdorf MJ, Shmookler BM, About lafia Aj, Malawer MM. Liposarcoma of the extremities: MR and CT findings In the histologic sub types. *Radiology*, 1993; 186: 455-459.

9. Kransdorf MJ, Bancroft LW, Peterson JJ, Murphey MD, Foster WC, Temple HT. Imaging of fatty tumors; distinction of lipoma and well-differentiated liposarcoma. *Radiology*, 2002; 224: 99-104.
10. Einarsdottir H, Soderlund V, Larson O, Jenner G, Bauer HC. MR imaging of lipoma and liposarcoma. *Acta Radiol*, 1999; 40: 64-68.
11. Einarsdottir H, Soderlund V, Larsson O, Mandahl N, Bauer HC. 110 subfascial lipomatous tumors: MR and CT findings versus histopathological diagnosis and cytogenetic analysis. *Acta Radiol*, 1999; 40: 603-609.
12. Matsumoto K, Hukuda S, Ishizawa M, Chano T, Okabe H. MRI findings in intramuscular lipoma. *Skeletal Radiol*, 1999; 28: 145-152.
13. Allen PW, Strings I, MacCormac LB. Atypical subcutaneous fatty tumors; a review of 37 referred cases. *Pathology*, 1998; 30: 123-135.
14. Stewart MG, Schwartz MR, Alford BR. Atypical and malignant lipomatous lesions of the head and neck. *Arch Otolaryngol Head Neck Surg*, 120: 1151-1155.
15. Laurino L, Furlanetto A, Orvieto E, Del Tos Ap. Well-differentiated liposarcoma (atypical lipomatous tumors). *Arch Otolaryngol Head Neck Surg*, 2001; 18: 258-262.
16. Kindbloom LG, Angervall L, Fassina AS. Atypical lipoma. *Acta Pathol Microbiol Immunol Scand [A]*, 1982; 90: 27-36.
17. Forus A, Larramendy ML, Meza-Zepeda LA, et al. Dedifferentiation of a well-differentiated liposarcoma: to a highly malignant metastatic osteosarcoma: amplification of 1q22-q24 associated with metastases. *Cancer Genet Cytogenet*, 2001; 125: 100-111.
18. Ohguri T, Aoki T, Hisaoka M, et al. Differential diagnosis of benign peripheral lipoma from well-differentiated liposarcoma on MR imaging; is comparison of margins and internal characteristics useful? *AJR*, 2003; 180: 1689-1694.
19. Matsumoto K, Takada M, Okabe H, Ishizawa M. Foci of signal intensities different from fat in well-differentiated liposarcoma and lipoma: correlation between MR and histological findings. *Clin Imaging*, 2000; 24: 38-43.
20. Yang YJ, Damron TA, Cohen H, Hojnowski L. Distinction of well-differentiated liposarcoma from lipoma in two patients with multiple well-differentiated fatty masses. *Skeletal Radiol*, 2001; 30: 584-589.
21. Meis JM, Enzinger FM. Chondroid lipoma: a unique tumor simulating liposarcoma and myxoid chondro-sarcoma. *Am J Surg Pathol*, 1993; 17: 1103-1112.

22. Gomez-Ortega JM, Rodilla IG, Basco Lopez de Lerma JM. Chondroid lipoma that may be mistaken for malignancy. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, 1996; 81: 586-589.
23. Lakshmaih SR, Scott KW, Whear NM, Monaghan A. Chondroid lipoma: a rare but diagnostically important lesion. *Int J Oral Maxillofac Surg*, 2000; 29: 445-446.
24. Logan PM, Janzen DL, O'Connell JX, Munk PL., Connell DG. Chondroid lipoma: MRI appearances with clinical and histologic correlation. *Skeletal Radiol*, 1996; 25: 592-595.
25. Furlong MA, Fanburg-Smith JC, Miettinen M, The morphologic spectrum of Hibernoma: A clinicopathologic study of 170 cases. *Am J Surg Pathol*, 2001; 25: 809-814.
26. Spano JP, Taillibert S, Khayat D, Terrier P. Hibernoma: an uncommon tumor as a differentiated diagnosis of liposarcoma of the thigh. *Anticancer Res*, 2000; 20: 4803-4804.
27. Anderson SE, Schwab C, Stauffer E, Banic A, Steinbach LS. Hibernoma; imaging characteristics of a rare benign soft tissue tumor. *Skeletal Radiol*, 2001; 30: 590-595.
28. Atilla S, Eilenberg SS, Brown JJ. Hibernoma MRI appearance of a rare tumor. *Magn Reson Imaging*, 1995; 13: 335-337.
29. Peer S, Kuhberger R, Dessel A, Judmaier W. MR imaging findings in Hibernoma. *Skeletal Radiol*, 1997; 26: 507.
30. Cook MA, Stern M, de silva RD. MRI of a Hibernoma. *J Comput Assist Tomogr*, 1996; 20: 333-335.
31. Geis JR, Russ PD, Adcock KA. Computed tomography of a symptomatic infrapleural thoracic lipoma, *J Comput Tomogr*, 1988; 12: 54-56.
32. Andac N, Baltacioglu F, Cimsit NC, Tuney D, Aktan O. Fat necrosis mimicking liposarcoma in a patient with pelvic lipomatosis: CT findings. *Clin Imaging*, 2003; 27: 109-111.
33. Evans H. Liposarcomas and atypical lipomatous tumors; a study of 66 cases followed for a minimum of 10 years. *Surg Pathol*, 1988; 1: 41-54.
34. Chiang JM, Lin YS. Tumor spectrum of adult intussusception. *J Surg Oncol*, 2008 Nov 1; 98(6): 444-7.
35. Sakurai H, Kali M, Yamazaki K, et al. Intrathoracic lipoma: their clinicopathological behaviors are not as straight forward as expected. *Ann Thorac Surg*, 2008 Jul.; 86(1): 261-5.
36. Erdem HR, Nacir B, Ozeri Z, Karagoz A. [Episacral lipoma; a treatable cause of low back pain]. *Agri*, 2013 Apr; 25(2): 83-6.

37. Lee HK, Hawang SB, Chung GH, Hong KH, Jang KY. Retropharyngeal spindle cell/Pleomorphic lipoma. *Korean J Radiol*, 2013 May; 14(3): 493-6.
38. Jain P, Chakrabarty B, Kumar A, Gupta N, Kabra M, Gulati S. Encephalocraniocutaneous melanosis, *J child Neurol*, 2014 Jun; 29(6): 846-9.
39. Choi JW, Kim HJ, kim J, Kim HJ, Cha JH, Kim St, spindle cell lipoma of the head and neck: CT and MR imaging findings. *Neuroradiology*, 2013 Jan; 55(1): 101-6.
40. Matsumoto K, Hukuda S, Ishizawa M. MRI findings in intramuscular lipoma. *Skeletal Radiol*, 1999 Mar.; 28(3): 145-52.