TUMOROUS ABNORMALITIES OF ADIPOSE TISSUE

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The term “lipopathy” is used by Lever (1963) as applying to a group of unrelated disorders of fatty tissue, particularly of the subcutaneous fat, whereas Williams and Glomset (1962) employ it to designate any condition of abnormal fat metabolism. Localised or unusual depositions of fat may be classified as lipomatosis to distinguish them from ordinary obesity (Cannon, 1950).

Fat cells are found in the subcutaneous tissue of the entire body with the exception of the eyelids, penis, scrotum, and labia minora. Tumorous abnormalities of the adipose tissue may occur in the following forms:

- Lipomas and liposarcomas;
- Lipogranulomatosis;
- Multiple diffuse lipomatosis;
- Gardner’s syndrome;
- Systemic multicentric lipoblastosis;
- Hibernoma.

Lipomas form the commonest soft-tissue tumours of the extremities, being especially frequent in the region of the shoulder and upper thigh, although they are observed in almost any part of the body. 12% of the tumours are multiple (2-6) (Bick, 1936). Liposarcoma in contrast is rare, and only in very few instances has it been reported to arise in a pre-existing lipoma. Recurrent lipomas are often liposarcomas from the beginning (Stout, 1944). Mixed mesodermal growths with a fat-tissue component are classified as mesenchymomas, representing developmental disorders rather than true lipoblastic tumours (Tedeschi and Lyon, 1957).

Lipogranulomatosis is an inclusive term indicating the presence of fat in a granulomatous reaction following local injury, injection of medicaments, ischemia or inflammation. In the acute phase the features of inflammation may be evident, but later a nodular mass persists, showing attachment to the skin and a predisposition to calcification (Coventry, 1954).

In the condition of multiple diffuse lipomatosis numerous lipomas are present not only on the extremities but also on the trunk.

Their number may range in the hundreds. A hereditary incidence is not infrequent, with a dominant mode of transmission. It shows a male preponderance, and the age of onset varies considerably, so that the first appearance of a lipoma may precede puberty or be delayed until after the age of forty. A symmetrical distribution occurs so frequently that it is described by some as “diffuse symmetrical lipomatosis” (Gray and Jones, 1957). Occasionally the tumours are distributed in linear fashion along the course of peripheral nerves. Pain and tenderness are uncommon features but are present in a minority while the tumour is growing, disappearing when it reaches its full size. Fresh tumours make their appearance relatively suddenly and usually attain the maximal size in a short time. On chemical analysis the tumours consist of normal fat, identical in composition with that of the subcutaneous fatty tissue. Serum total and free cholesterol, lipids and phospholipids are normal (Shanks, Paranchych and Tuba, 1957). The general health remains unaffected and the tumours cause no concern except for cosmetic reasons or because of an unfortunate location resulting in mechanical interference with normal function. Confusion with neurofibromatosis is...
a common diagnostic error. This was the
diagnosis offered in the example illustrated
here (Fig. 1) by a consultant physician and a
consultant surgeon who had examined the
patient on separate occasions. The history in
this instance had so far extended over 15 years,
fresh tumours arising at varied intervals. While
no specific symptoms arose as a consequence
of the lesions, the patient had developed con-
siderable anxiety concerning their possible
malignant character. One of the swellings was
therefore removed and examination revealed
a simple lipoma.

An association of multiple subcutaneous
lipomas with enormous fat pads over the rectus
muscle and under the chin is recorded by
Gray and Jones (1959). Kurweg and Spencer
(1951) considered that the simultaneous pre-

cesence of other conditions, such as palmar
and plantar tylosis and multiple telangiectasias
is probably coincidental.

In contrast is the condition of Gardner's
syndrome (Gardner and Richards, 1953): hereditary polyposis of the rectum and colon
associated with abnormal growths elsewhere
in the body—in the skeletal system, particularly
in the skull, and in the soft tissues, especially
the subcutaneous, mesenteric and retroperito-
neal regions. The variety of tumours is
remarkable and includes lipoma, fibroma,
leiomyoma, epidermal cyst and bony exostosis.
An interesting report is presented by Laberge, Sauer and
Mayo (1957). The patient was originally treated
for subacute bacterial endocarditis when a
subcutaneous lipoma was noted in the left
lumbar region. 4 years later he was success-
fully operated for multiple polyposis and
carcinoma of the colon. At that time another
lipoma was observed on the anterior abdominal
wall. Two further lipomas had appeared when
the patient was seen again 3 years later. After
a further two years an operation was performed
for a tumour of the mesentery which was
found to consist of connective tissue with
areas of fat necrosis.

From a review of the literature Laberge and
others (1957) conclude that the association of
colonic polyposis with other tumours is not
fortuitous, and suggest that when multiple
tumours are present, the possibility of polyposis
of the colon should be entertained.

Systemic multicentric lipoblastosis constitutes
a distinct entity to be differentiated from
multiple lipomatosis. The subject has been
analysed by Tedeschi (1946). Non-encapsulated
fat-tissue growths appear in an unpredictable
and disorderly manner involving subcutaneous
tissue, internal cavities, bones and internal
organs. The rate of progress is slow, but
characteristically excision is followed by local
recurrence. Within the growth mature fat cells
predominate; although the frequency of transi-
tional forms indicates an origin from undifferen-

tiated mesenchymal cells, this origin is similar to the development of fat tissue
under normal conditions, and Tedeschi suggests
that systemic multicentric lipoblastosis is a
hyperplastic rather than a neoplastic process.

Systemic multicentric lipoblastosis contrasts
with the benign nature of multiple subcutaneous
lipomas. The case reported by Tedeschi (1946)
illustrates the gravity of the condition. An
apparently simple lipoma appeared in the
popliteal space of this patient, and only after
the passage of 6 years was there evidence of
 multicentric proliferation of fat tissue. A fatal
issue ensued after the lapse of a further 6 years.
A singular peculiarity of the case was an
epidural location of one fatty mass, resulting
in paraplegia. Relief of the paralysis succeeded
its removal, but it recurred twice, and death
rapidly followed the third laminectomy.

Fat exists in the embryo in two forms:
white and brown. White adipose tissue has a
universal distribution, but the occurrence of
brown fat is limited to the interscapular, cer-
vical, axillary and perirenal areas. Probably
brown fat is limited to the interscapular, cer-
cell. In post-natal life no further formation
occurs and in the early post-natal phase trans-
formation of the multifocular brown fat cell
to the unilocular normal fat cell takes place. 
Adult brown fat displays these differences in
distribution and gross and microscopic appear-
ance. It also differs in its chemical constitution
and its response to various physiological con-
ditions, but no specific function has been
attributed to this specialised tissue (Novy and
Wilson, 1956). Hibernating animals show pro-
minent collections of brown fat, but the
important role in hibernation formerly ascribed
to brown fat is now discredited. The rare
benign tumour of brown fat received the design-
nation of hibernoma because of its similarity to
the hibernating gland of animals. It presents
clinically as a freely movable, firm, non-
tender swelling, and, as would be anticipated
from the normal sites of brown fat, it occurs
most frequently in the inter-scapular, cervical
and axillary regions. It displays considerable
vascularity in contrast to the ordinary lipoma,
and this is a useful guide to the clinical dia-
gnosis. The tumour is encapsulated and of
tan to brown colour. Removal is not attended by recurrence, but malignant degeneration, while rare, has been described.

We have seen 2 cases of hibernoma. The first one, occurring over the scapula in a man of 32 has been previously described (Jennings and Behr, 1955). The second one was found in a girl of 19 over the medial border of the left scapula. It had first been noticed 6 weeks previously and was thought to be getting larger. On examination there was a lobulated well defined swelling 8 x 9 cm. in size. On removal it was found to be very vascular, lobulated and of tan colour. Histological sections showed the typical multilocular fat cells. The photographs show this picture and the lobulation seen on cross section of the tumour. (Figs. 2 and 3).

**Summary**

The various tumorous abnormalities of adipose tissue are reviewed, and personal cases of multiple diffuse lipomatosis and hibernoma are described.

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