SHORT COMMUNICATIONS

Translocation (12;14) in Lipoma: A Case Report and Review of the Literature

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ABSTRACT: We report a case of an intramuscular lipoma with the following karyotype: 46,XY,t(12;14) (q14–15;q24). To our knowledge, this is the third report of a t(12;14) as a sole abnormality in a lipoma.

INTRODUCTION

Lipomas are benign adipose tissue tumors composed of mature fat and are the most common mesenchymal neoplasms in humans. Intramuscular lipomas are deep tumors and consist of mature lipocytes that infiltrate the muscle in a diffuse manner [1]. Numerous cytogenetic studies of lipoma have been reported in the literature [2]. The translocation between chromosome 12 and other chromosomes constitutes the most common karyotypic anomaly. The recurrent abnormalities of chromosome 12 include translocations or insertions or both with chromosomes 1, 2, 3, and 21. We report a case with a translocation between chromosomes 12 and 14 as the only cytogenetic change.

CASE REPORT

A 52-year-old man presented with a clinical history of a long-standing shoulder mass that had recently increased in size in the year prior to his seeking medical attention. Magnetic resonance imaging showed a fatty tumor, most likely an intramuscular lipoma. On November 12, 1996, the patient underwent surgical removal of a mass located in the mid- to anterior third of the deltoid muscle.

Pathologic examination revealed a well-circumscribed mass that was yellowish tan and grossly lobulated, consistent with fibroadipose tissue, measuring 5.0 × 2.0 × 0.7 cm. Histologically, the tumor showed a typical picture of lipoma. The diagnosis of an intramuscular lipoma was made at that time.

MATERIALS AND METHODS

A fresh tumor sample was shipped to our laboratory in sterile medium. The tissue was minced well and disaggregated in collagenase (200 U/mL) overnight [3]. The next day, the suspensions were seeded in flasks and on cover slips with RPMI medium supplemented with 17% fetal bovine serum, 1% L-glutamine, and 2% antibiotics (penicillin 100 U/mL, streptomycin 100 μg/mL) and incubated at 37°C and 5% CO2. Cells were harvested after 5 days of growth on cover slips. After an overnight treatment with Colcemid (0.01 μg/mL), hypotonic shock and fixation with methanol:acetic (3:1) were performed. Cover slips and slides were banded by using a trypsin-Giemsa staining technique [4], and the karyotypes were described in accordance with the International System of Human Cytogenetic Nomenclature [5].

RESULTS

Twenty metaphases were analyzed and showed the following karyotypes: 46,XY,t(12;14)(q14–15;q24)[8]/46,XY[12] (Fig. 1).

DISCUSSION

Cytogenetic analyses of lipoma have shown that rearrangements of chromosome 12 at bands q13–15 are the most consistent change and constitute 64% of the lipomas with clonal abnormalities [6]. These rearrangements consist of translocations between chromosome 12 and a variety of other chromosomes, particularly with the long arm of chromosome 3. Chromosomes 1, 2, and 21 also have taken...
part in translocations with 12q. However, chromosome 14 involvement is rare. We present a case with a clonal translocation between chromosomes 12 and 14 with breakpoints at 12q14–15 and 14q24. To our knowledge, only two cases of lipoma have been reported with t(12;14) as a sole abnormality. In two other cases, chromosomes 12 and 14 were participants in complex rearrangements (Table 1).

Intramuscular lipoma is a relatively common condition that frequently causes concern because of its large size, deep location, and infiltrative growth. The most important sites are the large muscles of the extremities. Microscopic examination generally reveals mature lipocytes infiltrating the muscle [1]. Cytogenetic analyses of intramuscular lipoma are relatively rare. Sreekantaiah et al. [6] reported eight cases of intramuscular lipoma; clonal chromosomal abnormalities were present in all cases. Of these cases, seven had single translocations or other abnormalities involving chromosome 12. Our present case with t(12;14) fits into this group.

Myolipoma, a very rare variant of lipoma, consists of mature adipose tissue and interspersed smooth muscle bundles. Myolipoma of the uterus is also known as lipolei-

![Figure 1](image.png)

**Table 1** Lipomas with t(12;14)

<table>
<thead>
<tr>
<th>Abnormality</th>
<th>Age/sex</th>
<th>Reference</th>
</tr>
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<tbody>
<tr>
<td>40–46,XX,t(12;14)[q15;q32]</td>
<td>53/F</td>
<td>Mrózek et al., 1993 [7]</td>
</tr>
<tr>
<td>46,XY,t(12;14)[q13;q24]</td>
<td>43/M</td>
<td>Mandahl et al., 1994 [8]</td>
</tr>
<tr>
<td>46,XX,der(1)t(1;12)[q42;q15],</td>
<td></td>
<td></td>
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<tr>
<td>der(12)t(12;14)[q15;q21]t(1:14)[q42;q24],</td>
<td>32/F</td>
<td>Mandahl et al., 1994 [8]</td>
</tr>
<tr>
<td>del(14)[q21q24]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46,XX,der(8)t(8;15)[q22;q22],del(12)[q15],</td>
<td></td>
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</tr>
<tr>
<td>der(14)t(12;14)[q15;q22],add(15)[q22],</td>
<td>49/F</td>
<td>Mandahl et al., 1994 [8]</td>
</tr>
<tr>
<td>der(17)[14;17][q22;p13]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46,XY,t(12;14)[q14–15;q24]</td>
<td>52/M</td>
<td>Present study</td>
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A case of lipoleiomyoma with t(12;14) was reported by Hu et al. [9]. In this particular case, all cells showed a t(12;14)(q15;q22) and some cells, in addition, had a secondary change involving chromosomes 1 and 5. An interesting aspect of our case is that the translocation between chromosomes 12 and 14 is one of the most frequent structural abnormalities in uterine leiomyoma, a benign smooth muscle tumor [10–12]. This suggests that intramuscular lipoma may have the same chromosomal abnormality found in uterine leiomyomas.

Our cytogenetic study represents only the fifth reported case of t(12;14) in lipoma, and the third in which t(12;14) is the only abnormality. We believe that translocations between chromosomes 12 and 14 may be a primary change in a subtype of lipoma, and this cytogenetic similarity between lipoma and leiomyomas may be a consequence of a similar mechanism that regulates the behavior of benign neoplasms. Additional cases need to be investigated to determine the significance of these findings. However, although cytogenetically the breakpoints on chromosome 12 in the t(12;14) in lipoma and uterine leiomyoma may appear to be similar, molecularly their involvement has been shown to be different [13]. Thus, the HMGIC gene, localized to the long arm of chromosome 12, is disrupted by the translocation in lipoma, whereas in leiomyoma the breakpoint is from 10 to more than 100 kb upstream of HMGIC [13].

REFERENCES