

Buffalo hump and HIV-1 infection: Current concepts and treatment of a patient with the use of suction-assisted lipectomy

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Human immunodeficiency virus (HIV) -1 infection, or its treatment with protease inhibitors, may be associated with abnormal fat deposition. One or more of several areas may be affected, including the dorsal-cervical fat pad ('buffalo hump'), abdominal region ('protease paunch', 'crixbelly'), breasts or as a generalized lipomatosis. Fat accumulation is most common in the dorsal cervical and the abdominal areas. Only a relatively small number of patients have been studied, therefore, the true incidence of this accumulation is not known. The present study describes an HIV-1-infected man who developed a very large buffalo hump after treatment with indinavir who was successfully treated using tumescent suction-assisted lipectomy. This is the first published report of a buffalo hump treated using this modality.

Key Words: *Buffalo hump; Fat suction; HIV; Lipodystrophy*

La bosse de bison et l'infection au VIH-1 : concepts actuels et traitement d'un patient par liposuction

RÉSUMÉ : L'infection au virus de l'immunodéficience humaine de type 1 (VIH-1) ou son traitement avec des inhibiteurs de la protéase du VIH, peuvent être associés à un dépôt anormal de graisse. Un ou plusieurs sites peuvent être touchés, y compris le coussinet adipeux dorso-cervical (bosse de bison), la région abdominale (« panse à protéase », « ventre à Crixivan »), les seins ou se présenter comme une lipomatose généralisée.

L'accumulation de graisse est plus fréquemment observée dans les régions dorso-cervicale et abdominale. Seul un nombre relativement petit de patients ont été étudiés ; par conséquent, l'incidence véritable de cette accumulation de graisse n'est pas connue. La présente étude décrit un homme infecté par le VIH-1 qui a développé une énorme bosse de bison après un traitement avec de l'indinavir et qui a été traité avec succès par liposuction des tuméfactions. Il s'agit du premier rapport publié sur le traitement de la bosse de bison par cette méthode.

Recent studies have demonstrated that human immunodeficiency virus (HIV) -1 infection, or its treatment with protease inhibitors, may be associated with abnormal fat deposition (1-11). This can occur in one or more of several areas including the dorsal-cervical fat pad ('buffalo hump'), abdominal region ('protease paunch', 'crixbelly'), breasts or as a generalized lipomatosis. The most common areas of fat accumulation are in the dorsal cervical (1-4) and the abdominal areas (5,6,8,11). The true incidence of this accumulation is not known because only a relatively small number of patients have been studied (12).

The present study describes an HIV-1-infected man who developed a very large buffalo hump after treatment with indinavir who was successfully treated using tumescent suction-assisted lipectomy. This is the first published report of a buffalo hump treated using this modality.

CASE PRESENTATION

A 52-year-old man who had been HIV-1 positive for 10 years presented with a massive football-sized 'buffalo hump' in his dorsal cervical area (Figure 1). A minor degree of fullness in this area was present during the preceding several years; however, it had increased dramatically in size since he began taking indinavir approximately one year previously. During this time, the patient's neck size increased from 18" to 26". His physician had discontinued the drug after six months. The patient had a history of diverticulosis, which responded

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Figure 1) Left and right A 52-year-old human immunodeficiency virus (HIV)-1-infected man presented with a football-sized mass in the dorsal cervical area ('buffalo hump'). It had existed as a minor area of fullness for several years, but had dramatically increased in size over the preceding year, after the protease inhibitor indinavir was added to his antiviral regimen

to an anterior sigmoid resection and medical treatment. He also had a history of esophageal ulcers, oral candida infections, hepatomegaly, diarrhea, fever and fatigue. His current medications included lamivudine (3TC), stavudine (D4T), acyclovir, saquinavir and ritonavir. His CD4 count was 350/mm³, and his viral load was undetectable at fewer than 500 copies/mL (Chiron 2.0 assay).

After obtaining thorough informed consent, the patient was placed under general anesthesia and, while in the prone position, 1500 mL of tumescent solution (1L of Ringer's lactate with 20 mL of 1% xylocaine plain solution and 20 mL of 0.5% Marcaine plain solution) was injected into the posterior cervical and upper back area. The area was subsequently suctioned through several small incisions at the base of the neck. A total of 1400 mL of aspirate was obtained. He had an uneventful postoperative recovery and wore a pressure garment for six weeks. There was no significant further accumulation of fatty tissue in this area over the following year (Figure 2). During that time, his weight remained steady, but he developed further areas of fat accumulation in the abdominal and breast areas, and further areas of wasting in his face and limbs.

DISCUSSION

Enlargement of the dorsal-cervical fat pad ('buffalo hump') has been reported in a number of HIV-1 infected patients, including both men and women (1-4,6,10-12). Some investigators have speculated that this finding may be associated

specifically with protease inhibitor treatment, particularly indinavir (2). However, a recent study by Lo and colleagues (4) involving eight HIV-1 infected men, each with 'buffalo hump', demonstrated that only four of these patients had a history of previous protease inhibitor use. The other four had no exposure to protease inhibitors (4). The development of a buffalo hump is, therefore, not unique to protease inhibitor therapy.

Lo and colleagues have shown that when compared with HIV-1-positive controls without a buffalo hump, eight men who had a buffalo hump had a significantly greater proportion of fat in the trunk region, suggesting a central fat accumulation (4). The patients with a buffalo hump did not have elevated levels of triglycerides, cholesterol or cortisol (4). Other studies have shown that a number of HIV-1 infected men and women demonstrated dramatically increased abdominal fat within several months after adding indinavir or other protease inhibitors to their antiviral regimens (5,6). This increased abdominal girth can occur with or without the development of a buffalo hump.

Using computed tomographic scanning, Miller and co-workers (5) analyzed 11 patients who were taking indinavir who subsequently developed increased abdominal girth with abdominal symptoms. These patients were compared with 10 HIV-1-infected patients who were taking indinavir, but who had no abdominal findings, and 10 HIV-1-infected patients who were not receiving indinavir. All 20 patients who were



taking indinavir had increased visceral adipose tissue. The 10 patients who were receiving indinavir and who also had abdominal findings showed particularly high levels of visceral adipose tissue. No buffalo humps were reported in this series. Symptomatic visceral fat accumulation does not seem to necessarily be a precursor to a buffalo hump or vice versa.

The exact etiology of the fat accumulation associated with a buffalo hump, abdominal adiposity or in other areas is unclear. These findings may be part of a common syndrome or there may be different clinical disorders associated with the various areas of fat deposition. Patients who developed a buffalo hump or abdominal fullness did not develop a concomitant increase in body weight (4,5). There may be a redistribution of adiposity from other areas of the body (eg, face and limbs) to areas of fat accumulation (10). One year after liposuction treatment, the patient in the present study demonstrated increased wasting of his face and lower limbs, with fat accumulation in the abdominal and breast area. It has been speculated that a regional abnormality in lipogenesis and lipolysis may occur, possibly influenced by the hormonal and metabolic changes seen with HIV-1 infection and its treatment.

The patient in the present study had a favourable result following treatment of his buffalo hump using tumescent suction-assisted lipectomy. There was no significant recurrence of the hump over the following year. No other pub-



Figure 2) Left and above *Appearance of dorsal cervical area one year after tumescent liposuction. There was no significant further accumulation of fatty tissue*

lished reports describing the treatment of this condition using this modality are known of by the authors. There is a report of one patient who had surgical removal of 350 g of adipose tissue, with no subsequent reoccurrence of the buffalo hump (4). Because it is less invasive than surgical resection, fat suction may have a role in treating HIV-1-infected patients with pathological fat accumulation. No current knowledge of the outcome of fat that can be transferred from an area of accumulation, such as a buffalo hump or abdominal area, to an area of wasting, presently exists. Fat redistribution in HIV-1-infected patients is, therefore, an exciting area for future research.

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