Scleredema adultorum of Buschke: an under recognized skin complication of diabetes

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**Summary**

Scleredema of Buschke or scleredema diabetorum is a skin complication of diabetes with deposits of collagen and aminoglycans in the dermis. This disease characterized by thickening and hardening of the skin, is usually localized in nape, back and shoulder areas. Consequences could be a decrease in motility of the shoulders and an impairment of respiratory function. Other possible complications are sleep apnoea syndrome and monoclonal gammopathy. Type 1 or type 2 diabetes may be associated with scleredema of Buschke in more than 50% of cases. Diabetes-related risk factors are long duration of the disease, presence of microangiopathy, overweight and need of insulin. Various specific treatments proposed in the literature are poorly validated. In most severe cases, radiation therapy may be useful.

**Key-words:** Scleredema of Buschke · Scleredema diabetorum · Diabetes mellitus.

**Résumé**

Le scléroédème de Buschke ou scleredema diabetorum est une complication cutanée du diabète caractérisée par des dépôts de collagène et d’aminoglycanes dans le derme. Cette maladie marquée par un épaississement et une dureté de la peau, est localisée principalement au niveau de la nuque, du dos et des épaules. Elle peut limiter la mobilité articulaire ou la fonction respiratoire. Elle peut aussi se compliquer de syndrome d’apnées du sommeil et de gammapathie monoclonale.

Les diabètes, type 1 comme type 2, sont à l’origine de plus de la moitié des cas de scléroédème de Buschke. Les facteurs de risque liés au diabète sont une longue durée d’évolution, la présence de complications de microangiopathie, une obésité et un recours à l’insulinothérapie. Les divers traitements spécifiques proposés manquent de validation. Les cas les plus graves peuvent nécessiter une radiothérapie.

**Mots-clés:** Scléroédème de Buschke · Scleredema diabetorum · Diabète.
Introduction

Scleredema adultorum of Buschke is a skin disease which belongs to a group of disorders characterized by increased accumulation of collagen and aminoglycans in the dermis [1,2]. This rare condition from unknown origin is often observed in diabetic patients and accordingly is also called scleredema diabeticorum [3]. However, as this skin disorder is rather uncommon and develops insidiously, it seems useful to sensitize diabetologists to this diabetic complication by reporting a case recently observed in our institution.

Case report

Mr. F., a 44 year old male, (BMI: 27 kg/m\(^2\)) suffered from type 1 diabetes for 17 years (anti GAD antibodies positive). Metabolic control was poor with HbA\(_1c\) values ranging between 8 and 9.6 % despite insulin treatment according to a basal-bolus schedule with combination of aspart and glargin (0.9 unit/kg/day). He showed preproliferative diabetic retinopathy treated by laser photocoagulation. Renal function was normal (microalbuminuria: 5 mg/l, plasma creatinine: 85 \(\mu\)mol/l). Blood pressure fluctuated and was found elevated (150/90 mm Hg) in some occasions. Echocardiography, ECG and chest X-ray were normal.

He noticed the progressive limitation of the left shoulder motility and was referred to a rheumatologist. This specialist diagnosed a diabetes-related frozen shoulder and prescribed local corticosteroid injection followed by physiotherapy. The physiotherapist was surprised by the woody hardness and thickness of the skin and the impossibility of either depressing, rolling or pinching the skin (figure 1).

Further investigations were performed looking for consequences of scleredema on pulmonary function. Indeed, the patient exhibited a grade 2 dyspnea, explained by a frank restrictive pattern of pulmonary dysfunction without obstructive defect at spirometry. Nocturnal polysomnography was normal. Finally the search for a monoclonal gammopathy was negative.

Diabetes control was improved (mean of HbA\(_1c\): 8%, range 7.2-8.5%) but remained poor. Because scleredema induced disabilities, the patient was submitted to PUVA-therapy (cumulative dose 73.5 joules in 15 sessions) combined with physiotherapy, but without change in skin lesions, even in the area mildly affected. Therefore, this treatment was stopped and only physiotherapy was carried on.

Discussion

Scleredema adultorum of Buschke is a fibromucinous connective tissue disorder of unknown cause that belongs to a group of scleroderma-like diseases [1,2]. It is characterized

He suggested the patient consult a dermatologist who finally established the diagnosis of scleroderma adultorum of Buschke spreading on the shoulders and the upper part of the back of both the neck and the trunk. The initial diagnosis was questioned because limitation of motility of shoulders was likely due to the thickening and hardening of the skin and not to joint anomaly. The typical aspects on skin biopsy specimens from the area confirmed the scleroderma as shown in the figure 2. There was specific thickness of the dermal region. Enlarged collagen bundles were separated by small spaces in which the presence of mucin was detected by Alcian blue staining. No trace of either inflammation or epidermal involvement was observed. There was no detectable deposit of immunoglobulin.

Figure 1
Thickening and induration of the skin of the upper part of the back prevent the physician to pinch the skin. Note also the hypertrophy of skin-folds of the nape of the neck with an aspect suggestive of mild acantosis nigricans.

Figure 2
Histological aspect of biopsy specimen sampled from the affected area (x100, Alcian blue coloration). Dermis appeared to be thickened. Enlarged collagen bundles are separated from each other by spaces in which some mucin deposits are detected by Alcian blue staining.
by a localized induration of the skin with occasional erythema or pigmentation. The lesions are ill-defined, woody non-pitting plaques. The epidermis overlying the affected area wrinkles or takes a peau d’orange appearance when pinched. The lesions are usually confined to the nape, the neck, the shoulders and the upper part of the back as in our patient. The face and the tongue can also be involved leading to difficulties to open the eyes or the mouth, dysarthria or mastication troubles [4]. The thighs are a rare localization [5]. Hands and feet are never concerned. Scleredema may induce limitation in motion of upper limbs and a restrictive lung disorder. Association with obstructive sleep apnea syndrome has been reported in a large study from Martinique Island [6]. Cellulitis syndrome or delays in wound healing are possible [7]. Other organs such as heart, skeletal or ocular muscles, oesophagus, parotid glands, liver, pleura or peritoneum could also be involved in rare occasions (reviewed in 1,2). Scleredema-related death is uncommon [8]. It is worthy to note that monoclonal gammopathy may develop specially in non diabetic individuals several years after the onset of scleredema. 

The diagnosis is based on clinical presentation. Histological confirmation by punch or incision biopsy is not systematically required [9]. The specific histologic findings are represented by the thickness of the dermis due to both enlarged collagen bundles and the presence of clear spaces or “fenestrations” between them, filled with mucopolysaccharides. Mucin deposit is more likely to be observed in the deep dermis and can be stained with Alcian Blue dye. However, the presence of glycoaminoglycans deposits stained by Alcian Blue is inconstant and their absence does not exclude diagnosis. The normality of appendicical structures is specific of scleredema unlike in scleroderma. There is no sign of inflammation.

The main mechanism of the accumulation of the extra cellular matrix components seems to be represented by an abnormal expression of extracellular protein genes (type 1 and type 3 collagens, fibronectin) in skin rather than a decrease of clearing processes [10,11]. This gene dysregulation is observed in scleredema adultorum regardless of the presence of diabetes. The signals mediating the biosynthetic activation of fibroblasts are still unknown.

The origin of this skin disorder is unknown. Various aetiologies have been proposed concerning infection, autoimmunity, hyperinsulinism, or ischemia without convincing demonstration [reviewed in 1]. Scleredema is likely a heterogeneous syndrome due to both various mechanisms and diseases. Indeed, different presentations of the disease have been described. Benign forms, which follow an acute infection of the respiratory tract and are usually prone to regress thereafter, are observed mainly in children or young adults. More chronic forms are associated with systemic disease such as multiple myeloma [12], hyperparathyroidism [13], malignant insulinoma [14], Gougerot-Sjögren syndrome or rheumatoid arthritis [15,16]. The scleredema diabeticorum is also a chronic form of the disease. It is worthy to note that diabetes is observed in half of the cases of scleredema [17]. Scleredema has been observed in patients suffering from either type 1 or type 2 diabetes mellitus, even if type 2 diabetes seems to be largely more frequent in the rare large series published in the literature [3,6,17-19]. The more common features in the cases of scleredema diabeticorum reported in the literature are male gender, adult-onset and long duration of diabetes, poor metabolic control, requirement of insulin treatment and the presence of diabetes specific complications [19]. Hypertension [6,19] and obesity [6] could be other risk factors of scleredema diabeticorum.

The frequency of this skin complication in diabetic patients is largely underreported as a consequence of insidious incidence and usual self-limited progression of such a disease. Diverging results have been reported in the literature. Cole et al. [3] observed a prevalence of 2.5% in a population of 424 diabetic patients attending to the out-patient clinic. Sattar et al [20] found a prevalence of 14% in a population of 100 hospital-based diabetic patients. It is worthy to note that most of the cases in this series were previously unrecognised or neglected by MP or diabetologists.

Even if the prognosis is usually benign, it is important that specialists in diabetology should be aware of this skin complication and systematically look for it because of the possible functional consequences on motion or respiration. In addition, in presence of scleredema, it is also important to systematically search for specific complications such as blood dyscrasia or sleep apnea syndrome.

There is no consensual treatment. In the mildest cases, optimization of metabolic control and physiotherapy especially in case of motion or respiratory disability are recommended [1]. For the rare progressing forms, various systemic treatments have been proposed including corticosteroids, D-penicillamine, cyclosporine, methotrexate, PUVA therapy, prostaglandin E1, factor XIII or radiotherapy [reviewed in 1]. But these approaches have been tried on very few patients or even mostly in a single patient. Success seems to be limited in most of the cases. The most constant short-term beneficial effects in most severe cases have been observed with radiation therapy [21].

In conclusion, the frequency of scleredema diabeticorum in diabetic population is probably underestimated. Diabetologists should be aware of this skin complication of diabetes which can be easily diagnosed by simple clinical examination. This awareness is useful for the recognition of the disease and detection of possible specific complications. In most cases, scleredema is a self-limited benign condition. Improvement of diabetes control and physiotherapy are first line treatment. However, in more severe cases, with rapid progression or disabling consequences, collaboration with dermatologists is needed to determine the optimal treatment to control this disease with the best cost-benefit ratio.
References