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Basal Cell Carcinoma arising in a Hypertrophic Surgical Scar after Tubal Ligation and Reversal Surgery

Danilo C Del Campo*; Olubukola Babalola; Marian Russo

***Danilo C Del Campo, MD**
Resident, NYMC Dermatology, 1901 First Ave Rm 1206, New York, NY 10029
Email: danilo.delcampo@gmail.com

Abstract

This case describes a 57-year-old woman who had an enlarging scar over the site of previous tubal-ligation and reversal. Since the operation 10 years ago, the surgical scar was treated as a hypertrophic scar without resolution. Upon presentation to the clinic, a biopsy was performed since the lesion had been evolving in the last 3 months with high clinical suspicion for neoplastic etiology. Biopsy confirmed a nodular Basal Cell Carcinoma (BCC) within a hypertrophic scar without extension to surrounding tissue. BCC has a known progression from various etiologic factors such as sun-exposure, trauma, and burns. However, this is the first case in the literature that describes BCC developing from a surgical site of previous tubal-ligation and reversal. This case reviews the prior literature of BCC arising within surgical scars while highlighting the importance of keeping neoplasms in the differential diagnosis when observing or managing post-surgical scars.

Keywords

basal cell carcinoma; surgical scar; keloid; hypertrophic scar

Abbreviations

BCC: Basal cell carcinoma; DFSP: Dermatofibromasarcoma protruberans

Introduction

Basal cell carcinoma (BCC)is frequently reported in sun-exposed areas, trauma, burns, radiation, and chronic ulcers [1-4]. There have been reports of BCC arising within various surgical scars [5-15]. However, to our knowledge, there have been no cases reported in the literature where a BCC developed in surgical scar from tubal ligation and reversal. We describe a unique case of BCC originating in a hypertrophic scar after tubal ligation surgery.

Case Presentation

A 57-year-old light skinned female (Fitzpatrick skin type III) presented with 10-year history of a linear scar in the left inguinal supra-pubic region that appeared over the surgical site of a reversal tubal ligation performed 10 years prior (Figure 1). Six months after her operation, her post-operation scar was enlarging and was treated by her surgeon as a hypertrophic scar with intralesional corticosteroid injections. During the last 10 years, she sought the help of multiple physicians who further injected the lesion with intralesional corticosteroids under the presumptive diagnosis of hypertrophic scar. The

patient denied having pictures for comparison of the lesion from prior years. Within the last 3 months prior to presentation, the hypertrophic scar developed multiple pearly nodules within the lesion. She denied any personal history of skin cancers, including basal cell carcinoma (BCC). Furthermore, she denied any family history of other cancers, to her knowledge.

On physical examination, the left inguinal region had a 5.5cm x 1cm indurated linear plaque with pearly borders and mild central depression (Figure 1). Although the history of the lesion was suggestive of keloidal scarring, clinical suspicion was high for a neoplastic process based on the morphology of the lesion.

The patient underwent a broad shave biopsy of the lesion under local anesthesia. Histopathology showed pseudoepitheliomatous hyperplasia of the epidermis, dense dermal fibrosis with vertically-oriented vessels with nodules and cords of basaloid cells that extend into the dermis. Notably, the tumor arises from the epidermis and specifically only involves the scarred regions. Diagnosis was consistent with nodular basal cell carcinoma within a dense keloid scar (Figure 2A-2B).

Differential diagnosis included keloid/hyperplastic scar (as referred from location of prior surgical trauma, and later complicated by various corticosteroid injections) vs basal cell carcinoma (from clinical appearance with pearly borders, nodularity, and changing morphology) vs cutaneous sarcoidosis vs dermatofibromasarcoma protruberans (DFSP) vs other neoplastic process.

Two weeks after presentation, patient tolerated complete excision of lesion with clear margins under local anesthesia after which small depots of intralesional corticosteroids were injected into base of lesion to prevent recurrence of hypertrophic scarring. Patient was instructed to avoid further trauma or friction to region.

Upon two year follow-up, patient has been without recurrence of the lesion. Patient states that the lesion healed well after excision and had been applying silicone occlusive sheets nightly to scar region. Sun protection has been encouraged and full body skin exams are regularly performed in light of skin cancer history.

Discussion

This report describes the unique case of a BCC developing at the site of a hypertrophic scar from an uncomplicated tubal ligation and reversal surgery, 10 years after the operation. Hypertrophic scars are limited to the injury of dermal skin and usually start within the first 30 days of injury, whereas keloidal scarring notes growth beyond the initial skin injury and may take months or years to develop [16]. Both hypertrophic scarring and keloidal scarring are exaggerated collagen deposition processes with three basic stages: First with inflammation in first three to ten days; Second, with proliferation in next ten to fourteen days; and thirdly, with maturation and remodeling of collagen which occurs from here on. In this patient, the scarring process was limited to the surgical scar and hence is considered a hypertrophic scar.

BCCs are frequently reported in sun-exposed areas (sun exposure is widely accepted as one of the main etiologic factors), vaccination sites, burns, trauma, radiation, and chronic ulcers [1-4]. As per Table 1, there have been multiple reports of BCC arising within surgical scars, all of which are very rare [5-15]. Most of these cases occurred in patients between 40-60 years old with a latency period of months to years. Surgical scar BCCs are exceptionally rare in comparison to BCCs developing from post-burn, ulcer,

and vaccination sites (hence only surgical scar BCCs are compared in this report). However, to our knowledge, there have been no other cases reported in the literature where a BCC developed in surgical scar from tubal ligation and reversal.

The exact etiology of BCC at surgical scars remains elusive, but is thought to be multi-factorial: trauma, chronic irritation, slow initial healing, recurrent ulceration, and lack of immunologic mechanisms have been proposed as mechanisms for carcinogenesis [10]. Recent evidence describes surgical trauma (and chronic healing) promoting BCC tumorigenesis upon embryological fusion planes [17]. In this patient, the inguinal region lies upon an embryological plane and these areas facilitate the spread of tumor cells because these planes extend in a direction perpendicular to the surface of the skin [17]. Further studies also state the propensity of tumorigenesis in embryological planes due to increased angiogenesis, ample cell motility, and the hyper-secretion of growth factors such as keratinocyte chemokines and cytokines [17-18]. Therefore, surgical trauma (and chronic healing) could lead to increased propensity of BCCs when occurring in locations that highly favor tumorigenesis. In any case, BCC from surgical scars is most likely a multi-step process consisting of both genetic and epidemiologic factors [10].

In evaluating potential BCC lesions within scars, consideration needs to include age-related factors as well as the latency between surgery and malignancy [10]. Hence, the longer the duration of surgical scar on the patient, the increased the likelihood for consideration of BCC.

As per Table 1, we have found no report of BCC arising in the inguinal region related to a recurrent surgical scar [5-15]. The lack of any reports is intriguing due to both location (under chronic mechanic irritation due to rubbing of clothes and irritation is a predisposing factor to BCC) and the high frequency of this surgery worldwide.

With hypertrophic and keloid scars being so commonplace, it is important for physicians to recognize that neoplastic processes such as BCC may masquerade as a benign condition for a long latent period. With recurrence of the lesion and any evolution of the character of the lesion (color, shape, texture, symptoms, etc), all lesions should be further evaluated with a prospect of skin cancer as part of the differential diagnosis. Biopsy should warrant confirmation of suspicious lesions and to guide further treatment.

Learning Points

(a) While keloids and hypertrophic scars are commonplace, it is important to have a broad differential diagnosis.

(b) With chronic lesions, it is important to expand the differential diagnosis to include neoplastic processes.

(c) Any changes in morphology or symptoms should warrant further investigation and potential biopsy.

(d) Assumption of diagnosis from prior physicians can lead to diagnostic error and confirmation bias.

Figures

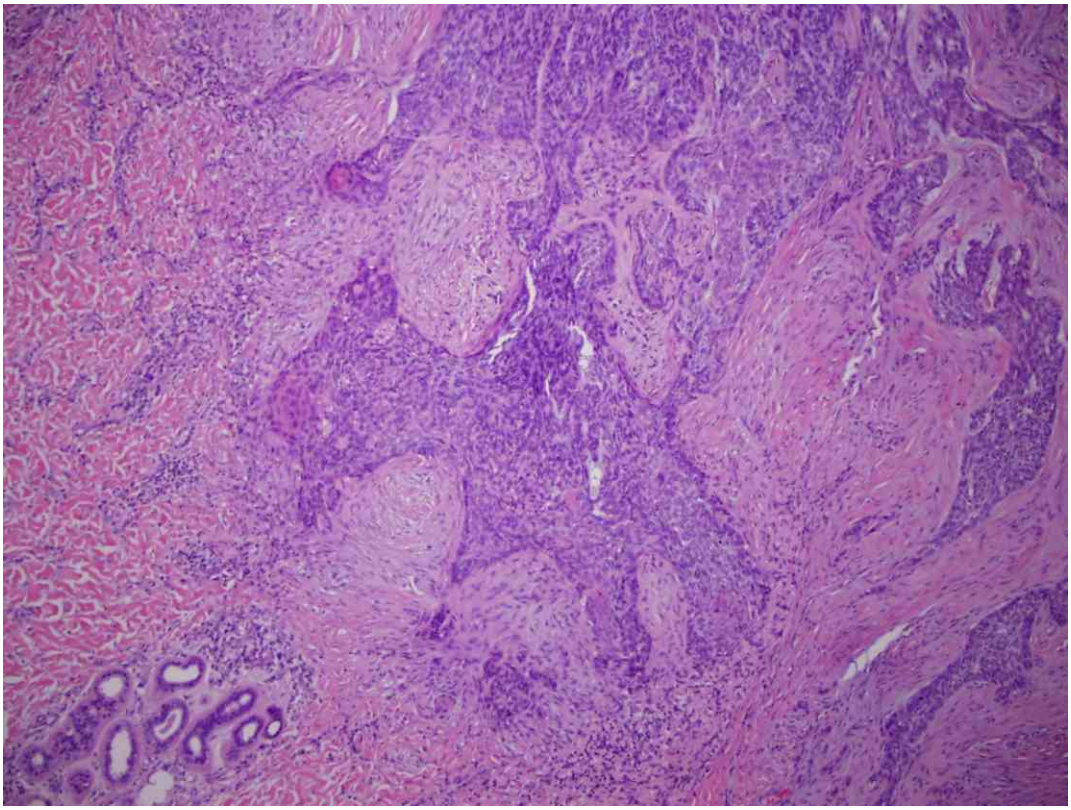

Figure 1: left inguinal supra-pubic region of BCC lesion arising in a surgical scar; pre-biopsy image of linear lesion over left inguinal region.

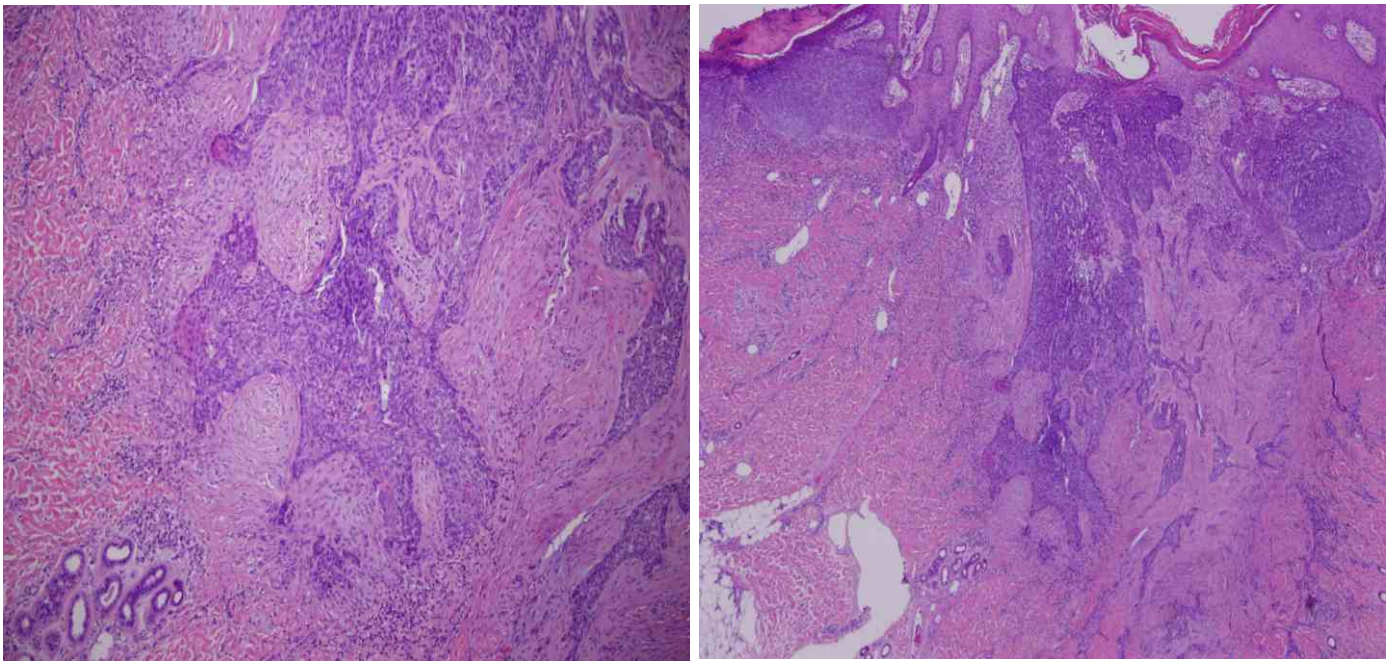

Figure 2A,B: H&E stain - The tumor is a nodular and infiltrating basal cell carcinoma occurring in the background of a scar. The scar is typified by reparative changes including pseudoepitheliomatous hyperplasia of the epidermis and dense dermal fibrosis with vertically-oriented vessels. The BCC is present both as nodules and cords of basaloid cells that extend into the dermis. The tumor is noted to arise from the epidermis. The majority of the BCC, especially the nodular component, appears to rest on top of the scar. The infiltrating portion is invested in typical tumor stroma that is more cellular and basophilic compared to the scar. When the tumor invades into the scar, it is seen to bring its stroma with it and appears distinct from the scar. In some foci, the tumor extends at least 75% of the full thickness of the scar. The BCC does not appear to be present in any significant way within tissues that do not contain scar.

Table

Procedure/Site	Age	Latency period (years)	Year	References
Colostomy site	67	33	1975	5
Hair transplantation recipient site	41	5	1979	6
Tracheostomy Scar	54	27	1983	7
Hermithyroidectomy	68	3-Feb	1994	8
Sternotomy (2 cases)	62	5	1998	9
	53	1	1998	9
Inguinal Herniorrhaphy	68	1	1999	10
Cleft lip repair	69	67	2001	11
Laparoscopic port site	54	21	2004	12
Parotid gland excision	49	6	2004	13
Midline Sternotomy	68	19	2004	14
Mastoidectomy (bilateral)	80	66-74	2008	15

Table 1: collection of case reports in the literature with BCCs at prior surgical sites.

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Authors Information: Danilo C Del Campo*; Olubukola Babalola; Marian Russo
Department of Dermatology, New York Medical College, USA

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