

# Marjolin's Ulcers in South Eastern Nigeria - A 15 Year Review at the Close of the last Millennium

Type of Article: Original

\*Bennard Jiburum, \*Kingsley Opara, \*\*Wilson Onuigbo

\* Plastic Surgery Division, Department of Surgery, Imo State University Teaching Hospital, Orlu, and Department of \*\* Pathology, National Orthopaedic Hospital, Enugu, Nigeria

## ABSTRACT

### OBJECTIVE

*Marjolin's ulcers first reported by Celsius more than 2000 years ago still have a poor prognosis with poorly understood evolution. Thought to be rare, it has been reported to be commoner in sub-Saharan Africa including southern Nigeria, with a more aggressive natural history. Thus an attempt is made to review the pattern of presentation of marjolin's ulcers, and challenges of management in South Eastern Nigeria as at the close of the last millennium.*

### METHOD

*Case records of patients managed for marjolin's ulcers at the National Orthopaedic Hospital, Enugu, Nigeria from January 1980 to December 1994 were reviewed. The data obtained were analyzed using descriptive statistics.*

### RESULTS

*Seventy (70) patients were managed for marjolin's ulcers in the period under review, constituting 27% of primary skin cancers managed in that period. The mean age of the patients was 44.9 years with a male: female ratio of 2:1*

*Thirty seven (53%) arose from an active chronic ulcer while 33(47%) originated from previous scars with an average interval of onset of 22.1yrs. The post-burn scars had a shorter interval of onset of 11.6yrs, compared to 29.8 yrs for the non-burn scars.*

*The lower limbs were most commonly involved (71%), while the trunk was least involved (3%). Squamous cell carcinoma was the histologic type in 66 (95%) patients.*

*Fifty two (74%) patients commenced treatment with amputation being the commonest form of treatment offered. Follow up was poor as only 3% had follow up for up to 5 years or until death.*

### CONCLUSION

*This study has shown that about 50% of Marjolin's ulcers arose from unstable scars and were therefore potentially preventable. Improved access to appropriate healthcare as captured in the millennium development goals should reduce the incidence and improve outcome.*

### KEYWORDS

*Marjolin's ulcer Pattern; Management Challenges; Southeastern Nigeria; Millennium Review.*

*Correspondence:-Dr. K.O Opara  
E-mail:kin2para@yahoo.co.uk*

### INTRODUCTION

Although Celsius first recognized tumours arising from scar tissue in the first century AD it was Jean Nicholas Marjolin's who first described it in detail in 1828<sup>1</sup>. In current usage, the term 'Marjolin's ulcer' refers to carcinomas arising from chronically inflamed, or scarred skin<sup>2</sup>. A number of theories on the

evolution of Marjolin's ulcer have been proposed. These include the toxin theory, chronic irritation theory, the co-carcinogen initiation and promotion theory and the immunologically privileged site theory, amongst others<sup>3-13</sup>. However none of these theories on its own can fully explain all aspects of the evolution of these cancers.

In spite of the slow growing nature of Marjolin's ulcers, they tend to be aggressive with an increased tendency towards development of invasive malignances<sup>14-16</sup>.

Although Marjolin's ulcers are generally reported as being rare<sup>17</sup>, with peak occurrence in the 6<sup>th</sup> and 7<sup>th</sup> decades of life and an average latency period of thirty years<sup>15,17-19</sup>, in sub Saharan Africa, these cancers are thought to be commoner, affecting a younger age group, and with a shorter latency period<sup>20</sup>. The aim of this study was therefore to review the pattern of marjolin's ulcers managed in South-eastern Nigeria over a 15-year period (1980-1994), with a view to highlighting the demographic features, the pattern of presentation, and challenges of management as at the close of the last millennium. This review is expected to provide a basis for comparison with the current trends in the pattern of this disease.

### Patient and method

This was a retrospective study of the 70 patients managed for Marjolin's ulcers at the National Orthopaedic Hospital, Enugu, in South-Eastern Nigeria from January 1980 to December 1994.

Data on demographics, clinical features and management outcome were collected from the patients' clinical records, and analyzed for means, gender ratio, site of lesion, duration of symptoms, aetiologic agents and management outcome using descriptive statistics.

### RESULTS

There were 191 cases of histologically confirmed skin cancers in the period under review, with 70 (27.3%) of these being Marjolin's ulcers.

Of the 70 patients with Marjolin's ulcers, 47(67%) were males and 23(33%) females with a male: female ratio of 2:1.

Their ages ranged from 15 to 81 years with a mean age of 44.9 years as shown in-Fig 1. Forty (57%) occurred in non traumatic ulcers/scars, 16 (23%) following non-burn trauma and 14(20%) in burn scars.

Thirty seven (53%) cases arose from an active chronic ulcer while 33(47%) arose from previous scars with an average interval of onset of 22.1yrs. The post-burn scars had a shorter interval of onset of 11.6yrs, compared to 29.8 yrs for the non-burn scars.

The commonest region of the body involved was the lower limbs in 50 (71%) patients, while the trunk was the least area of the body involved as shown in-Fig 2. Squamous cell carcinoma was the histologic variant in 66 (95%) patients. Malignant melanoma in 2 (3%) patients, and undifferentiated carcinoma in 2 (3%) patients.

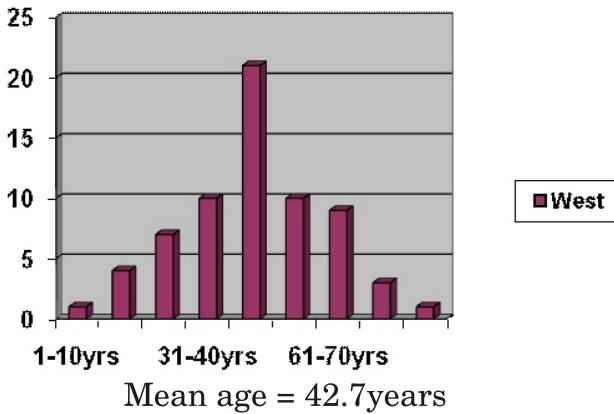
Fifty two (74.%) patients had treatment, while 18(26%) did not commence treatment either due to financial constraints or non acceptance of the modality of treatment offered. The commonest surgical treatment offered was amputation as shown in-Table1 . Of those who had treatment, 26 had no follow-up, 2 died and 24 had follow up for a variable period of time. Only 3 patients had follow up for up to 5 yrs as shown in-Table 2.

**Table 1:**

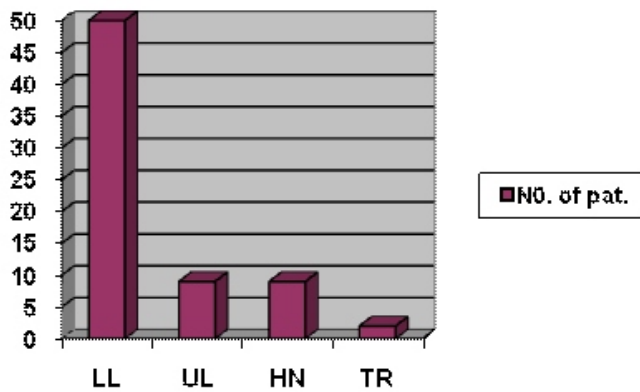
Treatment offered	N0. of patients	Percentage
AMPUTATIONS	30	42.9
Above knee	19	
Below knee	10	
Above elbow	1	
EXCISION + SSG	20	28.6
EXCISION + FLAP COVER	1	1.4
INTRALESIONAL 5FU	1	1.4
NO TREATMENT	18	25.7

**Table 2:**

	NO. of patients	Percentage (%)
FOLLOW UP	24	46.2
DEATH	2	3.8
NO FOLLOW UP	26	50



**Fig 1:** Age distribution



**Key:** LL= lower limbs; UL=upper limbs;



Late presentation in a patient with Marjolin's ulcer arising in a post burn scar **Fig. 3**

**DISCUSSION**

Marjolin's ulcers which are generally thought to be rare<sup>17</sup>, have been reported to constitute 1.2 to 2% of skin cancers<sup>14, 17</sup>. In this study, these cancers accounted for 36.6% of skin cancers seen in the period of study. A higher incidence of marjolin's ulcers in developing countries has also been reported by other authors<sup>18, 20</sup>. This is so because chronic leg ulcers as well as poorly managed thermal and non-thermal traumas, which are the leading risk factors for skin cancers in blacks<sup>21, 22</sup>, are not uncommon in our environment.

Most of our patients were in the 5<sup>th</sup> decade of life as shown in-Fig1, unlike findings in Industrialized countries where subjects in the older age groups were mostly affected<sup>18,19</sup>.

Further more Marjolin's ulcers have general been reported to develop in the younger age group amongst sub-Saharan patients<sup>20</sup>. The reason for this may simply be the relatively younger population of sub-Saharan Africa rather than a biologic factor.

This study showed a male preponderance, corroborating reports by other researchers<sup>24,25</sup>. Several reasons ranging from possible genetic factors, to environmental factors may be responsible. However considering the fact that the preexisting pathologies such as chronic leg ulcers and thermal and non thermal injuries are often more commonly seen in males, the male preponderance may not be unexpected.

Solar induced skin cancers commonly show preponderance for head and neck involvement<sup>26</sup>. Marjolin's ulcers on the other hand more commonly involve the lower limbs<sup>23, 27</sup>, as was seen in this study. This probably highlights the role of chronic irritation over and above actinic factors in the development of marjolin's ulcers. Treves and Pack<sup>7</sup> in support of Virchow's theory of chronic irritation<sup>25</sup>, had suggested that frequent attempts by the marginal epithelium at regeneration and



repair, with constant frustration may lead to loss of tissue restraint and eventual malignant change. Proactive intervention in ulcers and scars prone to chronic irritation should therefore be preventive. The significant involvement of the head and neck scars as seen in this study and others<sup>28</sup>, especially the scalp<sup>29,30</sup>, may however suggest some role for actinic radiation in the malignant transformation of scars. This perhaps fits into the co-carcinogenic theory of friedwald and Rouse<sup>6</sup>. Sun protective measures such as the use of sunscreens and protective clothing over these high risk scars may therefore offer some protection.

The average latency period for malignant transformation of scars in this study was 22.1yrs. This is significantly shorter than that generally reported for marjolin's ulcers<sup>15</sup>. It however agrees with reports that these cancers have a shorter latency period in sub-Saharan Africa<sup>20</sup>. Perhaps environmental and genetic factors indeed modify the behaviour of these cancers as suggested by Kowal-Vern and Criswell<sup>11</sup>.

The average latency period in the post burn scars was noted to be significantly shorter than that seen in the non burn scars; 11.6yrs and 29.8 years respectively. The shorter latency period of burn scars has been noted in other studies<sup>8,14</sup>. This probably supports the suggestion by Saffioti and Shubic<sup>31</sup> that the burning stimulus itself has some carcinogenic properties. Efforts at adequate burn care should therefore be encouraged: Where possible, healing of burn wounds by secondary intention should be avoided.

Squamous cell carcinoma was by far the commonest histologic variant reported. This is similar to findings in other studies<sup>7,9</sup>. The squamous cell carcinoma arising from a scar or chronic ulcer is thought to run a more aggressive course with a poorer prognosis than that occurring in non scarred skin<sup>8,14,15</sup>. The prognosis is further made worse by late presentation, a feature seen in this study (fig3) and other studies on marjolin's ulcers<sup>32-36</sup>.

Clinical and histopathological difficulties in diagnosing a squamous cell carcinoma on a scarred or ulcerated lesion have been highlighted as some of the reasons for this late presentation<sup>36</sup>. Socioeconomic factors such as wrong belief systems, and poverty also accounted for some of our patients presenting late. The problem of ignorance and poverty in our patients also reflected in the high proportion of patients who had histological diagnosis, but did not commence treatment either because they did not accept the therapy offered, or could not afford orthodox care.

The commonest form of treatment offered was amputation as was the case in other studies where late presentation was rife amongst the study population<sup>20,36,37</sup>. With a low receptivity towards amputations in our society even in recent studies<sup>37,38</sup>, it is no surprise that a significant proportion of our patients (26%) did not present for further treatment after the diagnosis was made.

Less than 50% of the patients came for follow up after initial discharge. And only 5.7% had follow up for up to 5 years. This poor follow up culture amongst patients in our environment is not peculiar to patients with marjolin's ulcer. Indeed even in more recent studies involving patients with unrelated conditions, poor patient compliance with follow up is evident<sup>39,40</sup>. Perhaps socioeconomic factors such as poverty and poor accessibility to healthcare facilities may be responsible for this. There is therefore a compelling need for a comprehensive health insurance scheme in this region and indeed other regions with similar challenges.

The outcome of this study shows that there is a need to reduce the incidence of marjolin's ulcers in our environment. In furtherance of this goal, a number of preventive measures should be adopted. Some of these preventive measures should include: Split thickness skin grafting of full thickness burn wounds to avoid secondary healing; Timely release of contractures followed by durable skin cover; Excision of unstable scars and provision of

durable skin cover; Adequate excision and proper management of all chronic ulcers as well as Appropriate treatment of all osteomyelitic lesions to avoid chronic discharging sinuses.

## CONCLUSION

This study has shown that about 50% of Marjolin's ulcers arise from unstable scars and are therefore potentially preventable. Improved access to appropriate healthcare should reduce the incidence and improve outcome.

## REFERENCES

1. Bowers RF, Young JM: Carcinoma arising in scars, osteomyelitis and fistulae. *Arch Surg*.1960;80:564-70
2. Smith J, Mello LF, NogueiraNeto NC, Meohas W, Pinto LW, Campos VA et al. Malignancy in chronic ulcers and scars of the leg (Marjolin's ulcer): a study of 21 patients. *Skeletal Radiol* 2001;30(6):331-7.
3. Fleming MD, Hunt JL, Purdue GF, Sandstad J: Marjolin's ulcer: a review and reevaluation of a difficult problem. *J Burn Care Rehabil* 1990, 11:460-469.
4. Hill BB, Sloan DA, Lee EY, McGrath PC, KenadyDE: Marjolin's ulcer of the foot caused by non-burn trauma. *South Med J* 1996, 89:707-710.
5. Neuman Z, Ben-Hur N, Shulman J: Trauma and skin cancer: implantation of epidermal elements and possible cause. *PlastReconstrSurg* 1963, 32:649-656.
6. Arons MS, Rodin AE, Lynch JB, Lewis SR, Blocker TG Jr: Scar tissue carcinoma. Part II: an experimental study with special reference to burn scar carcinoma. *Ann Surg* 1966, 163:445-460.
7. Treves N, Pack GT: The development of cancer in burn scars. *SurgGynecolObstet* 1930, 51:749-782.
8. Dupree MT, Boyer JD, Cobb MW: Marjolin's ulcer arising in a burn scar. *Cutis* 1998, 62:49-51.
9. Gadner AW: Trauma and squamous skin cancer. *Lancet* 1959, 273:760-761.
10. MacKenzie J, Rous P: The experimental disclosure of latent neoplastic changes in tarred skin. *J Exp Med* 1941, 73:391-395.
11. Kowal-Vern A, Criswell BK: Burn scar neoplasms: A literature review and statistical analysis. *Burns* 2005, 31:403-413.
12. Bostwick J, Pendergrast WJ, Vasconez LO: Marjolin's ulcer: an immunologically privileged tumor? *PlastReconstrSurg* 1975, 57:66-69
13. Ryan RF, Litwin MS, Kremenz ET: A new concept in the management of Marjolin's ulcers. *Ann Surg*. 1981;193:598-605
14. Duncan KO, Leffell DJ. Epithelial precancerous lesions. In: Freedberg IM, Eisen AZ, Wolff K. *Fitzpatrick's dermatology in general medicine*. 6 ed. New York: Mc Graw-Hill; 2003. p.719-36.
15. Esther RJ, Lamps L, Schwartz HS. Marjolin ulcers: secondary carcinomas in chronic wounds. *J South Orthop Assoc*. 1999;8:181-7.
16. Dupree MT, Boyer JD, Cobb MW. Marjolin's ulcer arising in a burn scar. *Cutis*. 1998;62:49-51.
17. Cruickshank AH, Connel EM, Miller DG. Malignancy in scars, chronic ulcers and sinuses. *J ClinPathol* 1963;16:573-80
18. Callam MJ, Harper DR, Dale JJ, Ruckley CV. Chronic ulcer of the leg: clinical history. *Br Med J (Clin Res Ed)* 1987;294(6584):1389-91.
19. Spira M, Stal S. Basal and squamous cell carcinoma of the skin. In: James W Smith and Sherrell J Aston, editors. *Grabb and Smith's Plastic Surgery*, fourth edition, Boston, Little Brown and Company 1991;731-56.
20. Nthumba PM. Marjolin's ulcers in sub Saharan Africa. *World J Surg*. 2010;34:
21. Achebe JU, Akpuaka FC. Skin cancers in Nigeria: a retrospective study and review of the literature. *West Afr J Med*. 1987;6:67-70

22. Amir H, Kwesiagbo G, Hirji K. - Comparative study of superficial cancer in Tanzania. *East Afr Med J* 1992; 69: 88-93.
23. Yakubu A, Mabogunje A. - Skin cancer in Zaria, Nigeria. *Trop Doct* 1995; 25(Suppl.): 63-67.
24. Abdolazim G. Marjolin ulcer: how much of safety margin needs along marjolin ulcer squamous cell carcinoma in recurrent cases. *Pak J Med Sci.* 2007;23: 394-397
25. Horton CE, Crawford HH, Love HG, Leffler RA. The malignant potential of Burn scar. *PlastReconstrSurg* 1958;22:348-53.
26. Cason PR, Robins P. Malignant tumours of the skin. In: McCarthy JG, editor. *Plastic Surgery*, vol. 4. Philadelphia; Saunders, 1990, 3614.
27. WankeNurimar CF, Ave Beatriz RC, Maceira Juan. Carcinoma epidermóideemúlcerangiódérmica: relato de novecasos. *An Bras Dermatol.* 1990;65:59-62.
28. Nelzen O, Bergqvist D, Lindhagen A. Venous and non-venous leg ulcers: clinical history and appearance in a population study. *Br J Surg* 1994;81(2):182-7.
29. Clement B, Lewis H, Lewis H, McKinstreyS, Grasy J, Byrnes D. A late, fatal complication of high energy thermal injury to the scalp. *Ann PlastSurg* 1995;35:650-3.
30. Curry SS, Gaither DH, King Jr LE. Squamous cell carcinoma arising in dissecting perifolliculitis of the scalp. A case report an review of secondary squamous cell carcinomas. *J Am AcadDermatol* 1981;4:673-8
31. Saffioti U, Shubik : The role of burning in carcinogenesis. *Br J Cancer* 1956;10:54
32. Baldursson BT, Hedblad MA, Beitner H, Lindelöf B. Squamous cell carcinoma complicating chronic venous leg ulceration: a study of the histopathology, course and survival in 25 patients. *Br J Dermatol.* 1999;140:1148-52.
33. Kontochristopoulos G, Kyriakis K, Symeonidou S, Katsiboulas V, Aroni K, Panteleos D, et al. Squamous cell carcinoma in chronic trophic ulcers of leprosy patients. *J Eur Acad Dermatol Venerol.* 2000;14:222-36
34. Baldursson B, Sigurgeirsson B, Lindelöf B. Venous leg ulcers and squamous cell carcinoma: a large-scale epidemiological study. *Br J Dermatol.* 1995;133:571-4.
35. Bosch RJ, Gallardo MA, Ruiz Del Portal G, Sanchez P, Arce MF, Herrera E. Squamous cell carcinoma secondary to recessive dystrophic epidermolysis bullosa: report of eight tumours in four patients. *J Eur Acad Dermatol Venerol.* 1999;13:198-204.
36. Vanessa O. ZagneBauk, Aline MesquitaAssunção, Renata Ferreira DominguesNurimar C, Fernandes, Tullia Cuzzi Maya, Juan PiñeiroMaceira, Marjolin's ulcer: A twelve-case report. *An Bras Dermatol.* 2006;81:355-358.
37. Asuquo ME Ikpeme IA, Bassey EE, Ebughe G. Squamous Cell Carcinoma in South-Eastern Equatorial Rain Forest in Calabar, Nigeria. *Eplasty.* 2009; 9: e53
38. Udosen AM, Ngim N, Etokidem A, Ikpeme A, Urom S, Marwa A. Attitude and perception of patients towards amputation as a form of surgical treatment in University of Calabar Teaching Hospital, Nigeria. *African helth sciences.* 2009;9: 254-7
39. Onah I. I, Olaitan P. B, Opara K. O, Amanari O. C. Cleft lip and palate repair: the experience from two West African sub-regional centers. *J PlastReconstrAesthet Surg.* 2008; 61(8):879-82
40. Omoti AE, Uhumwangho OM. Problems of management of primary congenital glaucoma in Benin City, Nigeria. *Niger Postgrad Med J.* 2007;14:310-3.