
Results

RESULTS

HISTOPATHOLOGICAL STUDY

The paraffin sections stained with hematoxylin and eosin stain were examined for:

1-Epidermal changes, whether hyperplastic or atrophic.

2-The dermis is examined for:

a) Change in blood vessels in reticular and deep dermis including their thickness and tortuosity. These changes are estimated on visual lenses using a scale + mild, ++ moderate and +++ strong.

b) Fibrosis which is scaled into + mild, ++ moderate and +++ marked.

c) Amount of hemosiderin + small amount, ++ moderate and +++ large amount.

d) Inflammatory cells: + mild nuclear, ++ moderate nuclear, +++ large nuclear. (Tables 2, 3).

	Epidermis	Degree of changes in dermal blood vessels		Degree of fibrosis	Amount of hemosiderin	Inflammatory cells	ICAM-1 expression
		Pap-dermal blood vessel	Reticular dermal blood vessel				
Case 1	Hyperplastic	+++	++	++	+	+++	Positive
Case 2	Hyperplastic	++	++	++	+	+	Positive
Case 3	Atrophic	+	+	+++	+	-	Negative
Case 4	Hyperplastic	+++	++	+	++	+	Positive
Case 5	Hyperplastic	+++	++	++	+	++	Positive
Case 6	Atrophic	+	++	++	+	+	Negative
Case 7	Hyperplastic	++	++	++	+	+++	Positive
Case 8	Atrophy	+	+	+++	-	-	Negative
Case 9	Hyperplastic	+++	++	+++	++	+	Positive
Case 10	Atrophy	+	+	++	+	-	Negative
Case 11	Atrophy	+	+	++	-	-	Negative
Case 12	Atrophy	+	+	+++	+	+	Negative
Case 13	Hyperplastic	++	++	++	+	+	Positive
Case 14	Hyperplastic	+++	++	++	+	+	Positive
Case 15	Atrophy	+	+	++	-	-	Negative

Table (2): The histopathological changes in chronic venous ulcer. The table illustrates the changes in blood vessels of the dermis, degree of fibrosis, amount of hemosiderin, inflammatory cells and ICAM-1 expression from case 1 to case 15.

	Epidermis	Degree of changes in dermal blood vessels		Degree of fibrosis	Amount of hemosiderin	Inflammatory cells	ICAM-1 expression
		Pap-dermal blood vessel	Reticular dermal blood vessel				
Case 16	Hyperplastic	+++	+++	++	-	-	Positive
Case 17	Hyperplastic	+++	+	++	+	-	Positive
Case 18	Hyperplastic	+++	++	+	-	+	Positive
Case 19	Hyperplastic	+++	+	+	-	+	Positive
Case 20	Atrophic	++	++	+	++	+	Positive
Case 21	Hyperplastic	++	++	+++	+	+	Positive
Case 22	Atrophy	+	+++	++	+	+	Negative
Case 23	Atrophy	+++	+++	++	+	+	Positive
Case 24	Atrophy	+	++	+++	+	-	Negative
Case 25	Hyperplastic	++	++	++	+	-	Positive
Case 26	Hyperplastic	+++	++	+	+	-	Positive
Case 27	Hyperplastic	+++	++	++	+++	+	Positive
Case 28	Hyperplastic	+	+	++	-	-	Negative
Case 29	Hyperplastic	+++	++	++	+	+	Positive
Case 30	Atrophy	+	+	++	+	-	Negative

Table (3): The histopathological changes in chronic venous ulcer. The table illustrates the changes in blood vessels of the dermis, degree of fibrosis, amount of hemosiderin, inflammatory cells and ICAM-1 expression from case 16 to case 30.

The epidermis in 18 cases out of 30 cases appears hyperplastic. It shows hyperkeratosis, acanthosis and elongation of rete ridges (Fig. 1).

The dermis in these cases shows elongated and tortuous capillaries and venules. They are prominent in the papillary and reticular dermis. Many of these vessels have thick and fibrosed walls and some of them are hyalinized (Fig. 2,3,4). Variable amounts of haemosiderin are present in most of the cases. Also, variable degrees of inflammatory cellular infiltrates are present in most of the cases. The infiltrate includes mostly lymphocytes, plasma cells and macrophages.

The other 12 cases show atrophic epidermis with flattened rete ridges. The dermis in these cases is mostly replaced by dense collagen fibers with few numbers of disrupted capillaries and skin appendages (Fig.5).

Figure (1): The epidermis appears hyperplastic. The figure shows hyperkeratosis, acanthosis and elongation of rete ridges.

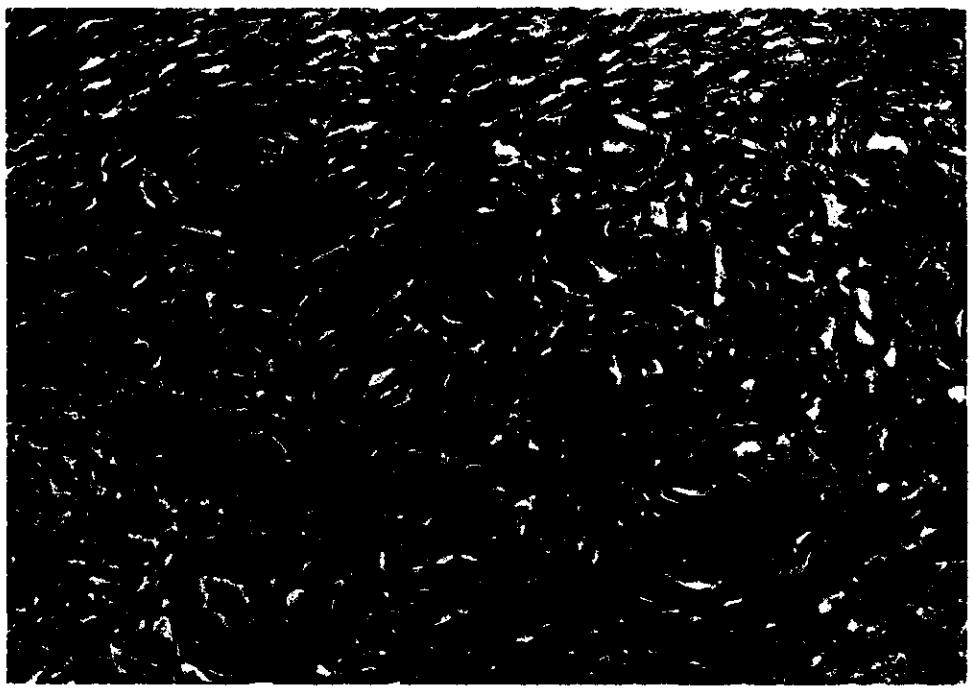

Figure (2): The dermis shows elongated and tortuous capillaries and venules.

Figure (3): Elongated tortuous capillaries and venules with thick and fibrosed walls.

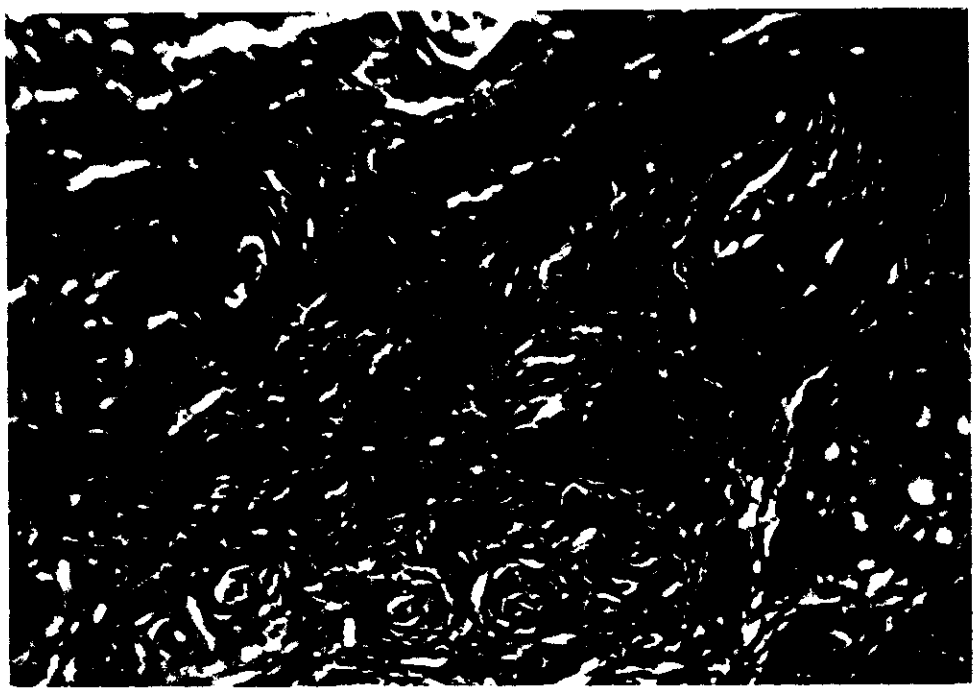

Figure (4): Thick, fibrosed and hyalinized walls of elongated and tortuous capillaries and venules.

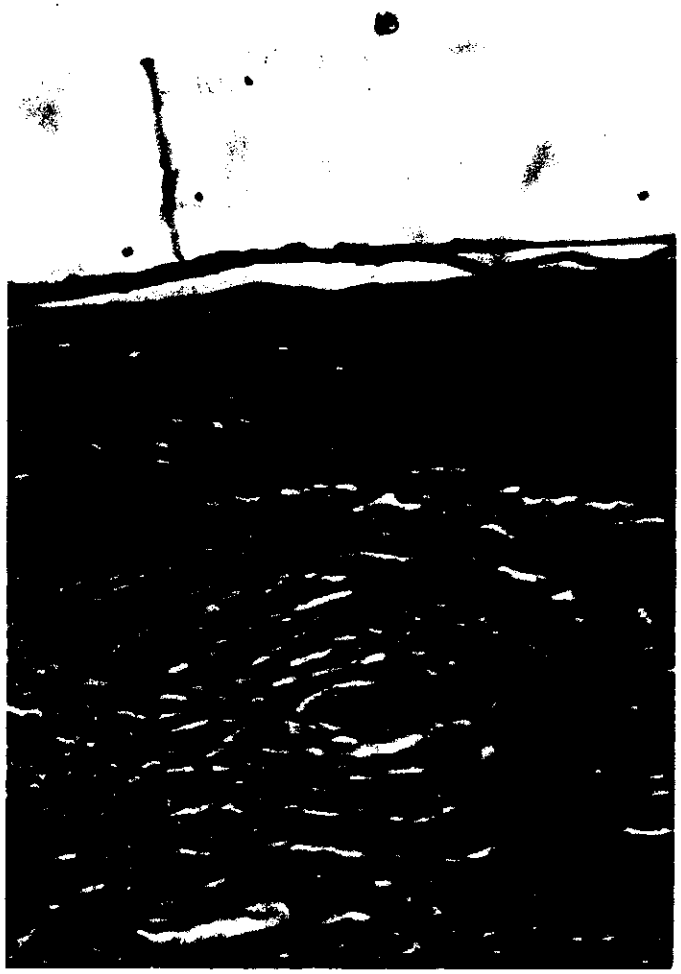

Figure (5): Atrophic epidermis with flattened rete ridges. The dermis is replaced by dense collagen fibers.

ICAM-1 STUDY

Frozen sections stained for ICAM-1 study were examined and the intensity of the stain was estimated on visual lenses using a scale negative and positive + mild, ++ moderate and +++ strong. (Tables 4, 5).

Positive cases	Capillaries		Keratinocytes	Inflammatory cells
	At the ulcer	Adjacent areas		
Case 1	+++	+	+++	+++
Case 2	++	+	+	+
Case 4	++	+	-	-
Case 5	++	-	-	+
Case 7	+	-	-	++
Case 9	+	+	++	-
Case 13	+	+	++	-
Case 14	++	-	++	-
Case 16	++	-	-	+

Table (4): Illustrates the site and degree of ICAM-1 expression.

Positive cases	Capillaries		Keratinocytes	Inflammatory cells
	At the ulcer	Adjacent areas		
Case 17	++	-	+	-
Case 18	++	+	++	+
Case 19	++	-	++	+
Case 21	+	+	+	-
Case 25	+	-	+	-
Case 26	++	+	-	-
Case 27	+++	+	+	+
Case 29	++	+	+	-

Table (5): Illustrates the site and degree of ICAM-1 expression.

ICAM-1 expression was seen in 17 cases out 30 cases. The expression was present in various sites, in the endothelial cells of the capillaries, keratinocytes and inflammatory cells. It was seen mostly in capillaries at the edge of the ulcer and to a lesser degree in the capillaries away from the ulcer.

At the edge of the ulcer, it gave mostly a moderate degree of ICAM-1 expression in 10 cases out and of 17 cases (Fig. 6) and week degree in 5 cases (Fig. 7) and high degree of expression in the other 2 cases (Fig. 8,9,10). The capillaries in the skin away from the ulcer gave weak to negative expression similar to normal control.

In kerationcytes 11 cases out of 17 cases gave positive ICAM-1 expression, 5 of them gave moderate expression (Fig. 11), 6 cases gave weak expression and other 6 cases gave negative expression.

In the inflammatory cells 8 cases gave positive ICAM-1 expression, 1 case showed high expression (Fig. 12), 1 case showed moderate expression, 6 cases showed weak expression and 9 cases were negative. (Tables 4, 5).

Figure (6): Moderate degree of ICAM-1 expression in endothelial cells of the capillaries at the edge of the ulcer.

Figure (7): Weak degree of ICAM-1 expression in endothelial cells of the capillaries at the edge of the ulcer.

Figure (8): High degree of ICAM-1 expression in endothelial cells of the capillaries at the edge of the ulcer.

Figure (9): High degree of ICAM-1 expression in endothelial cells of the capillaries at the edge of the ulcer.

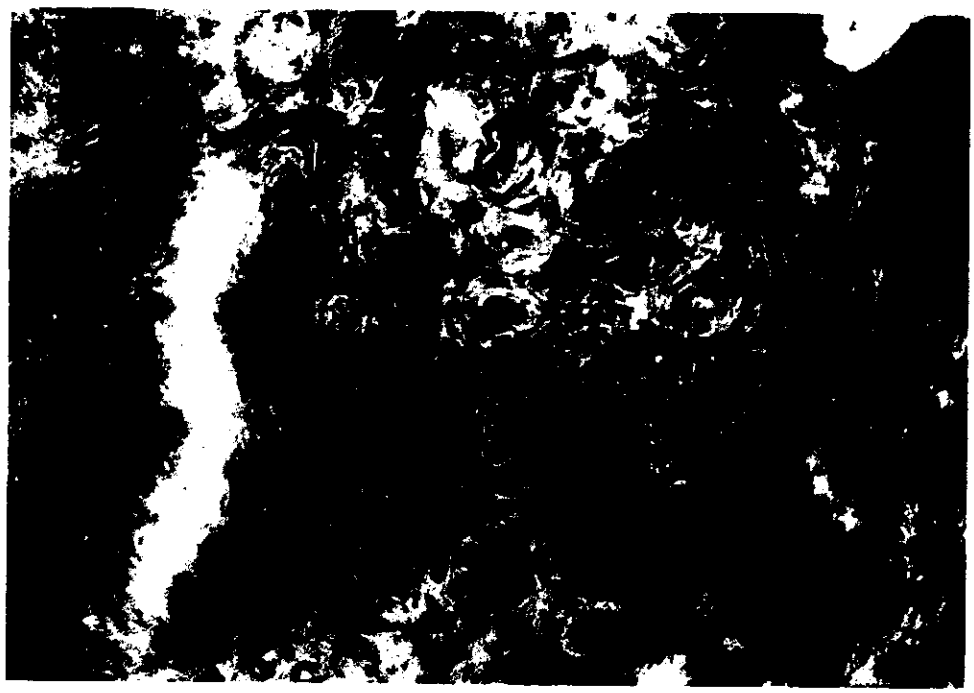

Figure (10): High degree of ICAM-1 expression in endothelial cells of the capillaries at the edge of the ulcer.

Figure (11): Moderate degree of ICAM-1 expression in keratinocytes.

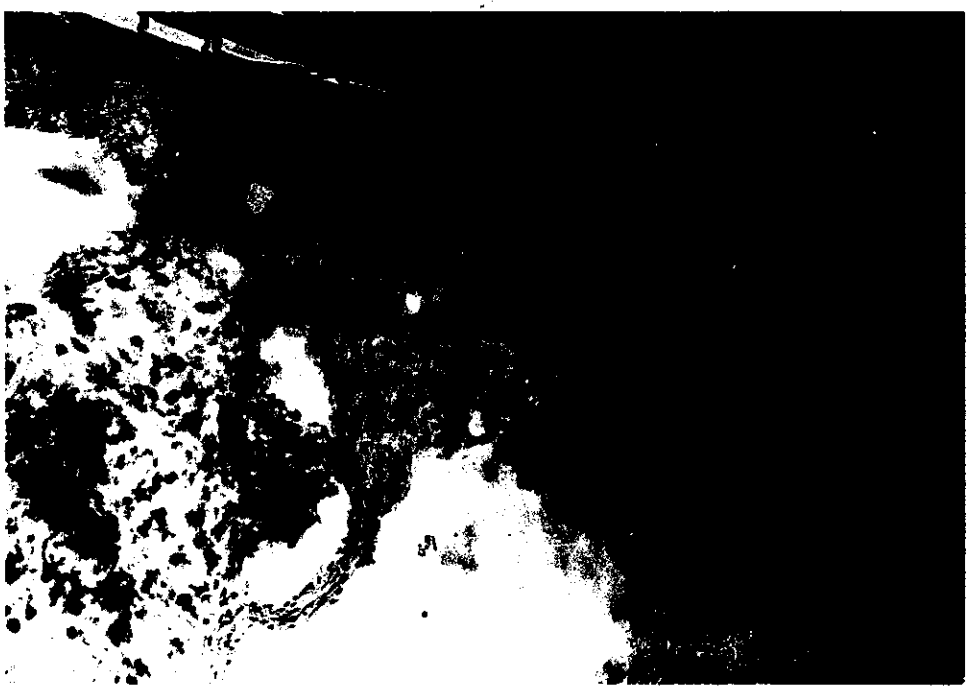

Figure (12): High degree of ICAM-1 expression in the inflammatory cells.