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RESEARCH ARTICLE

Histological Description of Hedgehog (*Hemiechinus auritus*) Abdomen Skin

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Abstract

The present study was conducted on six healthy male's hedgehog, to distinguish the normal histology of the abdomen skin. The hedgehogs were anesthetized by ketamine (15 mg/kg. body weight) injected intramuscular after scarfing of hedgehogs, the skinning of the ventral surface of the abdomen was carried out, then the skin specimens fixed in the formalin (10%). Routein histological processes were done. The histological structure of the hedgehog abdomen skin was revealed many invaginations of the skin folds projected from superficial surface; these folds had many bifurcation were divided by grooves, and the folds appeared as the ridges. The abdomen skins of hedgehog covered by keratinized squamous epithelium, the keratin layer consider as protective layer foe the superficial skin which represented the epidermis. Under lining the epithelium there was loose connective tissue that supported the superficial skin; and consisted of collagenous and elastic fibers as well as cellular elements such as fibroblasts, lymphocytes, myoid cells were distributed among collagen and elastic fibers which extended into the cores of the abdomen skin folds. Beneath the loose connective tissue, the dermal spines follicles were found and surrounded via a layer of smooth muscle fibers. Clusters of sweat glands were distributed deeply under the dermal spines follicles. Striated muscle fibers below the sweat glands. The striated muscle fibers were arranged; circular, longitudinal and oblique in the orientation, these muscle fibers which support the upper layer of the skin. The dermal papillae was absent in the hedgehog skin.

Keywords: *(hedgehog, Histology, Abdomen skin).*

Introduction

Hedgehog (Hemiechinus auritus) is long eared, belong to Asia and some middle east countries involving Iraq, hedgehog is depend on the plant and insects in their feeding, family of the hedgehog is Erinaceidae and belong to insectivora order [1].The common species in the united states are the African hedgehogs, the adult hedgehogs weight range between 300-600grams [2]. Easy differentiated between female and male of hedgehog, the male has a distinct prepuce similar to dogs, but the location of the testicles of hedgehogs in the abdominal cavity [3].

Mammalian skin consist of epidermis and dermis was separated by basement membrane, the epidermis covered by stratified squamous epithelium, their cells were pass through stages of mitotic divisions, migration, differentiation and keratinization, these cellular elements of epidermis reached to superficial layer to become death cells and sloughing from the epidermis surface[4]. The epidermis contains on the (90-95%) of the keratin cells as well as there are melanocytes, langerhans cells and Merkel's cells [5].Mammalian dermis divide into double layers; papillary layer composed from delicate fibers found under the basement membrane of the epidermis[6]. Second layer; reticular layer, the feature of this layer characterized by thickness due to the fibrous tissues which included collagen and elastic with few of reticular fibrous elements [7].Four main layers involved stratum basalae.

Stratum spinosam, stratum granulosum and stratum corneum[8].The stratum Malpighi which included stratum granulosum and stratum spinosum, these stratum in the rodent skin was characterized by less in the thickness; consist of two-four layers of the epithelial cells, and the stratum Malpighi in the rodents skin was undistinguish [9].

Two distinctive layers in the epidermis of rat tail[10]. The aim of this study to identify, the normal histological structure of hemichinus auritus abdominal skin.

Materials and Methods

This study was carried out on (6) males hedgehog free from diseases; these animals were captured by farmers in the Babylon agriculture regions. Animals were anesthetized by used ketamine anesthesia (15mg/kg B.W), intramuscular injection in the thigh muscles. The weight of the hedgehogs ranged (400-500) grams. The skinning of the abdominal skin, the skin specimens fixed by used formalin (10%) for period (48) hours. The histological procedures were done after fixation, which involved dehydration via serial graduate ethyl alcohol (50%, 70%, 80%, 90% and 100%), then clearing in the Xylene (30 minutes) after that the histological specimens of the abdominal skin was embedded in the paraffin wax, to obtain on the histological sections used rotatory microtome at the thickness (7) micrometer then the histological sections of the skin stained by used haematoxylin and Eosin stains [11].

Results

Male hedgehog epidermis covered by keratinized stratified squamous epithelium, the keratin represented death cells which protected the epithelium of the epidermis, the layers of the epidermis epithelium consisted of two layers enclosed by stratum corneum (Figure 1), the epidermis of the abdominal skin in the hedgehog was appeared delicate and projected as invaginations, the cores of these projections composed of the cellular elements such as fibroblasts, myoid cells and leucocytes as well as fibrous bundles of the connective tissue that represented by collagenous and elastic fibers. The epidermal invaginations (Figure 2) of the abdominal skin was bifurcated into primary, secondary and tertiary bifurcation, these investigations enclosed by layer of the keratin which termed stratum corneum, under the epidermis there is the dermis, it's contains on the follicles of the dermal spines, beneath, the dermal spines which found striated musculature tissue. The epidermal invagination of the hedgehog abdominal skin was projected as ridges (Figure 3), these epidermal invaginations were separated by grooves, and the dermal spines were accumulated as clusters in the dermis, the epidermal papillae was absent in the hedgehog skin. Figure (4), showed aggregation of the dermal spines adjacent to the epidermal projections, the sweat glands of the hedgehog abdominal skin was simple tubular glands, which lined by simple low cuboidal epithelium, these gland located around the dermal spines, medium size arteries and veins found between dermis and muscular tissue.

The dermal spines were revealed in the high magnification consisted of follicles which surrounded by myoid cells and delicate bundles of smooth muscle fibers (Figure 5), the center of the dermal spines it's composed of the spines shafts, that projected into the skin outside. The hedgehog abdominal skin had good striate musculature tissue which supported it, the muscular tissue located under the dermis, and arranged in the three direction, longitudinal, circular and oblique arrangement (Figure 6).

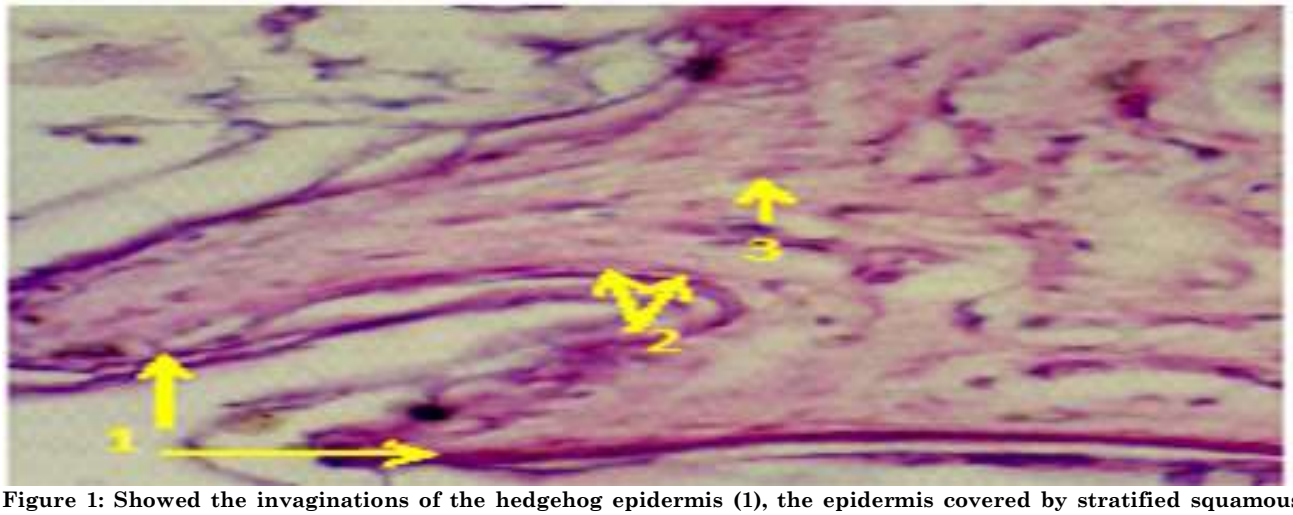

Figure 1: Showed the invaginations of the hedgehog epidermis (1), the epidermis covered by stratified squamous epithelium (2), the core of the epidermis projections consist of fibrous connective tissue with cellular elements (3), Haemtoxylin and Eosin 40X

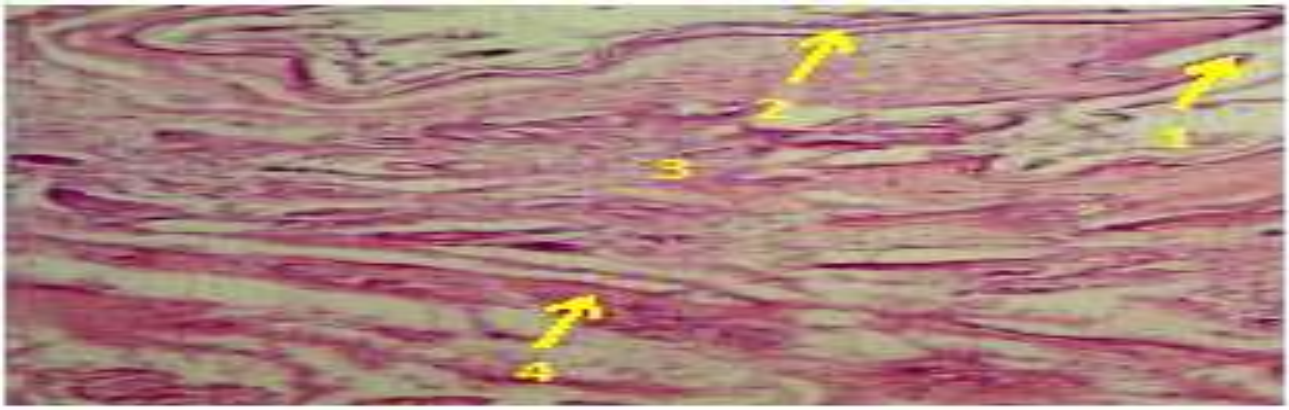

Figure 2: Appeared the bifurcation (1), in the epidermis of the hedgehog, the stratum corneum (2), that covered the stratified squamous epithelium under the epidermis, there is dermis (3), it's contain, dermal spines, and the musculature tissue (4).Haemtoxylin and Eosin. 20X

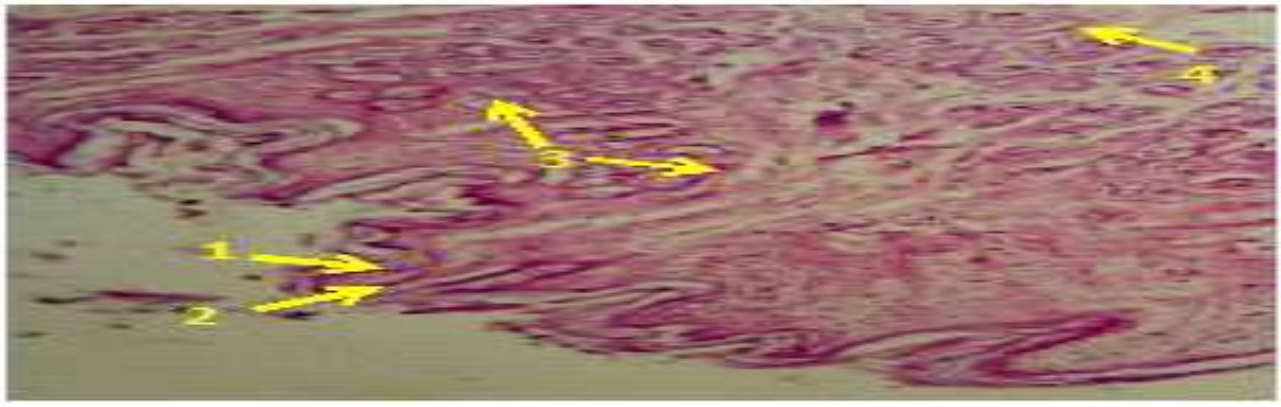

Figure 3: Revealed the stratum corneum (1), which encluded the rides (2), of the hedgehog epidermis, dermal spunes (3) distributed in the demis of the abdominal skin, among the dermal spines, there are sweat glands (4). Haemtoxylin and Eosin. 20X

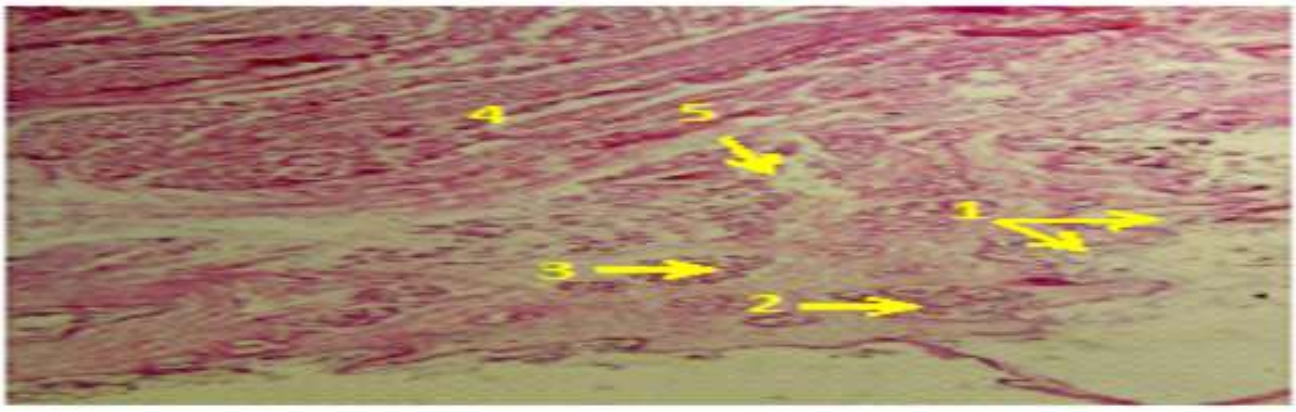

Figure 4: The epidermal projections of hedgehog were separated by groove (1), in the dermis showed accumulation of the dermal spines (2), under the dermal spines that found cluster of the sweat glands (3), Abundant striated muscle (4), beneath the dermal spines and sweat glands, blood vessels (5), which supply the contents of the dermis. Haemtoxylin and Eosin. 20X

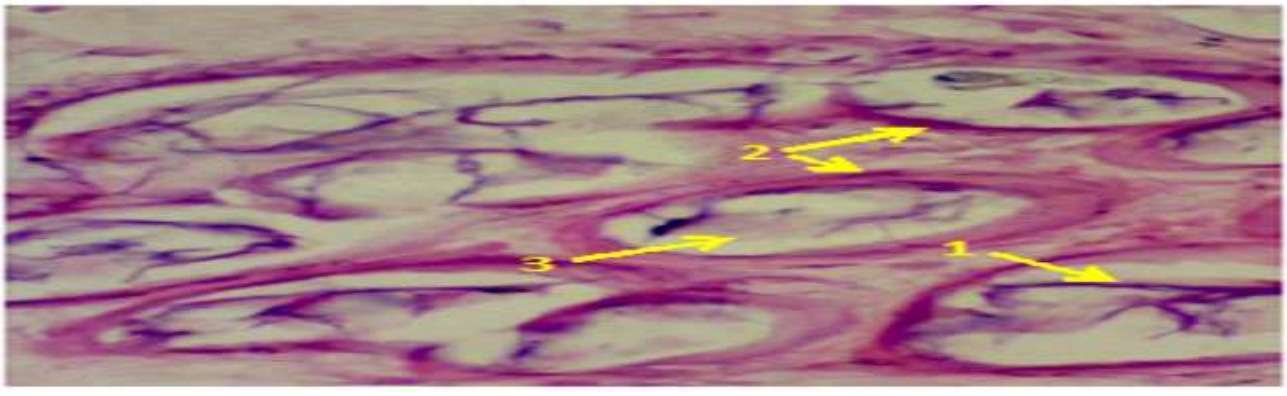

Figure 5: Showed the high magnification of the histological structure of the hedgehog dermal spines (1), surrounded by myoid cells (2), Haemtoxylin and Eosin 40X

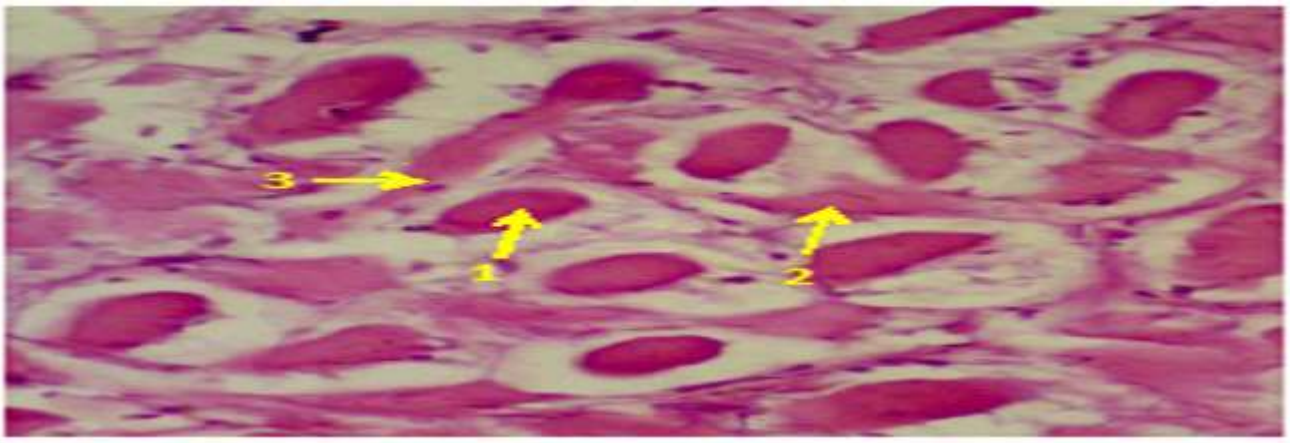

Figure 6: Revealed the arrangement of the muscular tissue under the dermis of the hedgehog, longitudinal (1), arrangement, circular (2), arrangement and oblique (3), arrangement. Haemtoxylin and Eosin. 20X

Discussion

Hedgehogs are important animals used in the medicinal experimental aspects, the characteristic features of the hedgehogs had dermal spines, these structures consider as the modification of the hair, hedgehogs used the dermal spines for defense against the predators, these suggestions corresponded with previous study [12] mentioned, the dermal spine of the hedgehogs were modified hairs to provide the protective rule from predictors. Abdominal skin of the hedgehogs characterized by delicate epidermis, covered by keratinized stratified squamous epithelium, the later consisted of two layers of the epithelium, these histological finding differed from the histological structure in the most mammal [13, 14, 15] they found, five stratum in the epidermis (corneum, lucidum, granulosum, spinosum and basalae), the authors were recorded and pointed out increased in the thickness of the epidermis and found the epidermis papillae, while these structure absent in the skin of hedgehogs, and the epidermis of the hedgehogs had epidermal invaginations were projected as ridges which separated by grooves, from another hand, these epidermal projections had primary, secondary and tiartary bifricutions, but the epidermis of the rodents (such rats, mice and rabbits) [16] identical with the present study in the cellular organization in the hedgehog epidermis. Dermis of the hedgehogs had dermal spines, the dermal spines follicles which surrounded by thin layers of smooth muscle fibers their function of these smooth muscle fibers, may be led to erection of the dermal spines. Beneath the dermal spines there is simple tubular sweat glands, which lined simple low cuboidal cell, these findings varied with current study on the millivora capenesis dermis [17], noticed the sweat gland ducts was lined by stratified cuboidal epithelium. The sebaceous glands not developed in the hedgehog, and the dermal spines devoid from these glands.

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