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**STRUCTURAL ANALYSIS OF THE EDGE OF THE CLEFT LIP
IN INDIVIDUALS WITH
CLEFT LIP WITH OR WITHOUT CLEFT PALATE**

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ABSTRACT

Three hundred and thirty six specimens of lateral and medial cleft margins from 168 infants with different types of cleft lips were studied histologically and compared with the normal. The structure and distribution of epithelial tissues and their appendages were compatible with the normal lip. However in some cleft lip specimens there was keratinisation of the mucous membrane. Occasionally sebaceous glands were present in the submucosa.

The structure of the blood vessels was compatible with the normal and no inflammatory changes were seen in them.

Disorganization of muscle tissue increased with the severity of the cleft. There was an increased amount of connective tissue and significantly less muscle tissue in the cleft lip than in the normal. There was no evidence of degeneration, regeneration, necrosis or phagocytosis in the cleft lip muscle.

The arrangement of muscle tissue in different types of clefts was studied. The importance of identifying the intrinsic and extrinsic muscle bundles in the cleft lip and repairing them separately was discussed.

Histochemical studies showed a reduction in the mean diameter of both type 1 and type 2 muscle fibres in the cleft lip. Electron microscopy confirmed that these fibres were hypotrophic.

The cleft lip had a significantly higher percentage of type 2 muscle fibres than the normal. This could possibly be due to delay or arrest in the transformation of type 2 fibres to type 1.

On ATPase staining fibre type differentiation was normal. On NADH and SDH stained specimens fibre type differentiation was impaired. The majority of fibres showed an intense reaction with these stains with focal darkly stained areas. Electron microscopy showed these to be mitochondrial aggregates. Some

of these mitochondria showed abnormalities in the crystal arrangement.

Reduction in the muscle quantity and increase in the connective tissue in the muscle layer suggest tissue damage. Reduction in the diameter of the fibres with ultrastructural features of hypotrophy implies possible arrest or retardation of growth of muscle fibres.

Mitochondrial abnormalities seen in the cleft lip muscle were similar to that of ischaemic muscle.

The possibility that hypoxia may have an association with the pathogenesis of clefting was discussed.

Experimental animal studies and human foetal studies are needed to clarify the possible relationship between hypoxia and clefting.