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CYTOTOXICITY OF CYCLOPHOSPHAMIDE IN THE RAT INCISOR

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Summary.—Three of the 4 groups of 3 Wistar rats each were given 40 mg, 80 mg and 120 mg cyclophosphamide/kg respectively by single intraperitoneal injections. The fourth group was given 2 ml of normal saline as control. One animal from each group was killed after 1, 4 and 8 days. The incisor teeth of all experimental animals showed evidence of cytotoxic injury, which appeared to be more severe with increasing dosage, to the undifferentiated mesenchymal cells in the proliferating zone of

the investigation of its cytotoxicity *in vivo* on histologically distinct groups of rapidly proliferating cells.

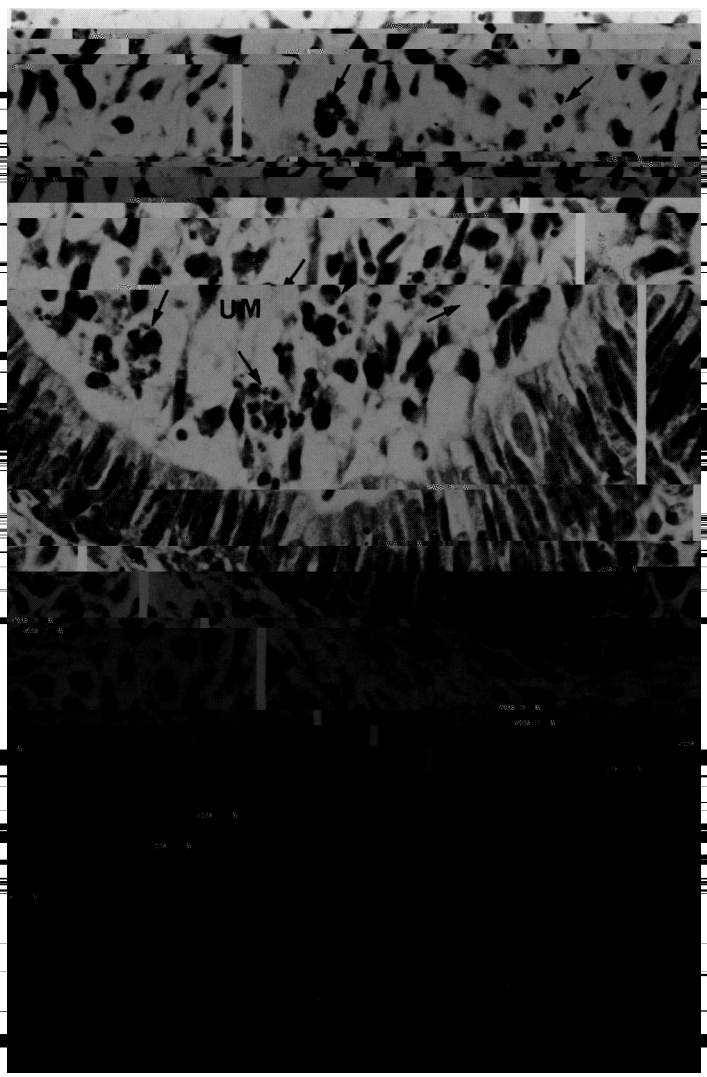
In some teeth, *e.g.* the incisors of the rat and the rabbit, formation of enamel is formed by odontoblasts. The ameloblasts differentiate from pre-ameloblasts in the internal enamel epithelial layer of the enamel organ, which, together with the rest of the proliferating odonto-

tooth throughout the life of the animal. end of the tooth, will be referred to in


UM

the mechanism of cytotoxicity of cyclophosphamide. The odontogenic considerations of this study have been presented elsewhere (Adatia, 1975). The

80 mg and 120 mg cyclophosphamide (Endoxana, W. B. Pharmaceuticals Ltd) respectively per kg by single intraperitoneal injections of a 2% solution in normal saline.



RESULTS

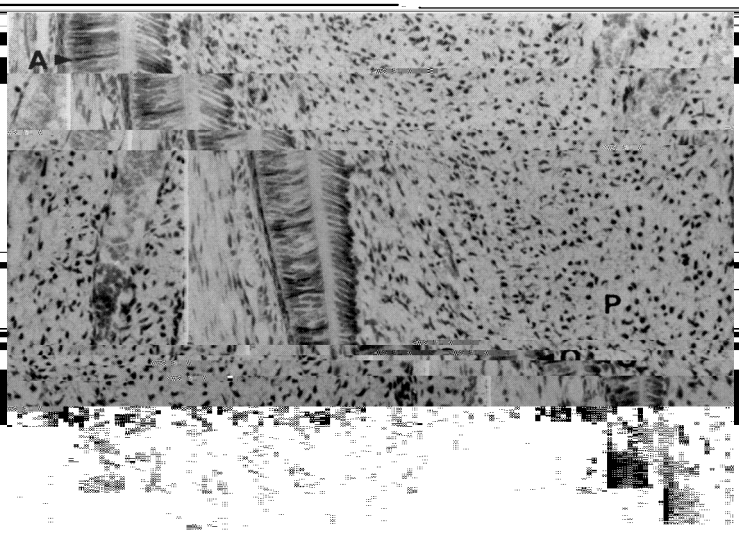
dav disintegrated or distended cells with

Control group

large, multiple or fragmented nuclei were

blasts, differentiated cells of the pulp and ameloblasts were apparently un-

observed in the groups given 80 mg/kg and 120 mg/kg (Fig. 4).



a section from

m the animals

the cells of th

administration

in the 40 mg

t root growth

obvious abnormality (Fig. 3). Some evi-

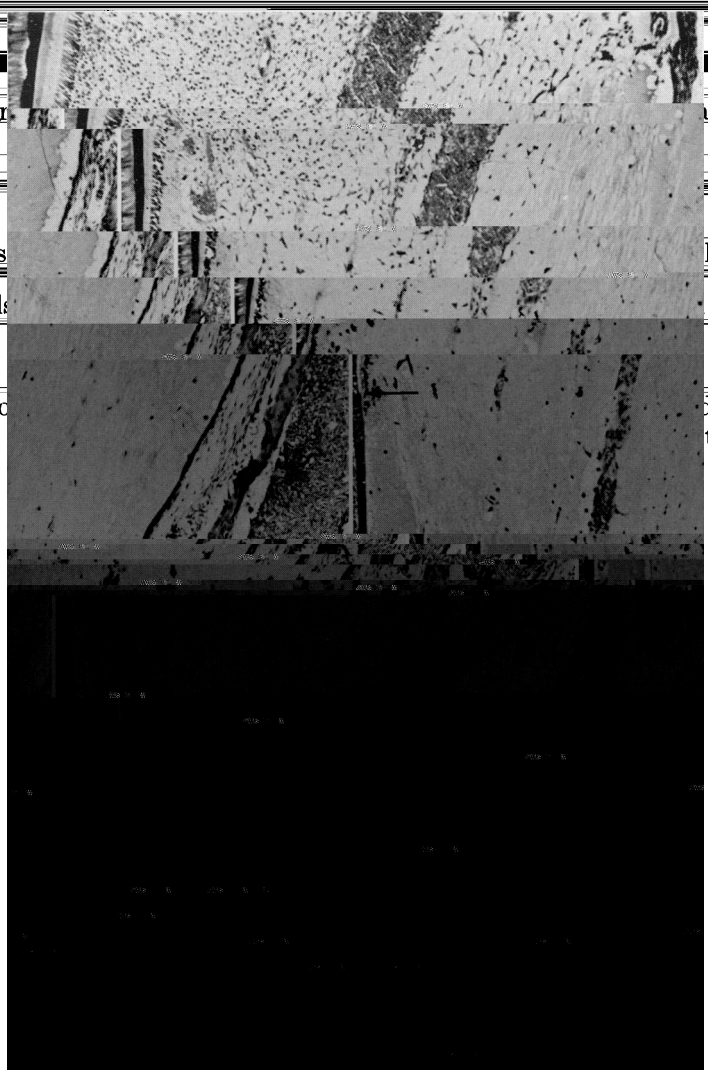
had stopped and there was an almost

dence of cellular abnormality in the acellular area in the pulp below the

odontogenic epithelium was, however, basal dentine. The pulp above this

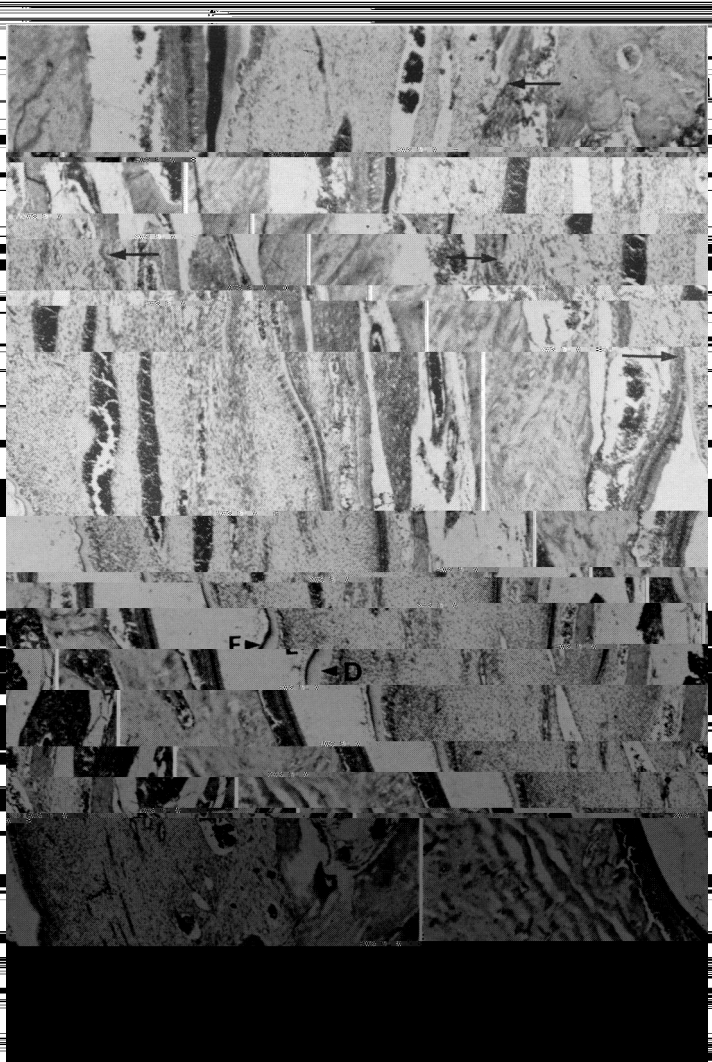
acellular area appeared normal. There was apparently normal pulp tissue close to the basal odontogenic epithelium in the 40 mg dose group (Fig. 6). In the groups given 80 mg/kg and 120 mg/kg the basal acellular
up to the bas
Distended cell
nuclei were nc
one day.

Eight days after injection of cyclophosphamide.—After 8 days apparently normal basal enamel and dentine formation for continuous root growth had recommenced in the 40 mg group (Fig. 7).



l basal morph-
lished in the
odontogenesis
deed, the state
th after 8 days

was apparently similar to that in the 40 mg group after 4 days. In the 120 mg group the relative acellularity of the basal area of



appeared to

DISCUSSION

Cellular changes related to the cytotoxicity of cyclophosphamide could be

mesenchymal

ental animals

the 80 mg group after 4 days. Never- killed one day after injection of the

parently spared in the 40 mg dose group. That the undifferentiated mesenchymal

It has been suggested that the specificity of cyclophosphamide for tumour cells cells in the proliferating zone of the pulp may be more sensitive than those

may be due to some aspect of permeability of the odontogenic epithelium to the

to the cells in the enamel organ, a further after giving higher doses to rats up to

genic epithelium and mesenchyme can microscopically demonstrable dentinal

Brock, N., Gross, R., Hohorst, H.-J., Klein, ... bolism of Cancer Chemotherapeutic Agents *via* ...

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