HISTOPATHOLOGICAL CHANGES IN TESTES IN MALE INFERTILITY

by

M. C. R. VYAS,* M.D.

V. B. KALRA,** M.D.,

H. L. ARORA,*** M. D.

and

S. JAIN,**** M.D.

Introduction

The importance of testicular biopsy was first recognized by Charny (1940) in male infertility and it was later extended by Hotchkiss (1948). Since then, testicular biopsy has been extensively employed by several workers as a diagnostic measure in human male infertility (Engle 1952; Jirasek and Jon Raboch 1963; Girgis *et al.* 1969; Malhotra and Deo 1969 and Wong *et al.* 1973). In the United States, approximately 15 out of every 100 marriages are barren and do not produce progeny (Simmons 1956). Defects in the husband's reproductive system are responsible in about 50% of the cases (Paulsen 1968). In this paper, the pathological findings of testicular biopsies from infertile males are presented.

Material and Method

Fifty-four testicular biopsies from the husbands of infertile couples received from the P.B.M. Group of Hospitals, Bikaner in the Department of Pathology and Microbiology were fixed in Formol sublimate and routine paraffine section-Sections were cut at 4-5 μ and stained by the standard haematoxylene and eosin staining, and sections were examined for any pathology in the testicular biopsies.

Observations

On the basis of histological appraisal of testicular biopsies, the cases of male infertility were classified into 6 groups as shown in Table. 1. The table also shows the pathological types with their incidence.

TABLE 1

Distribution of Cases

Group	No. of cases	(%)
1. Maturation arrest	19	(35.2)
2. Peritubular fibrosis	16	(29.5)
3. Sertoli cell only syndrome	8	(14.8)
4. Tubular hyalinization	3	(5.5)
5. Normal spermatogenesis	3	(5.5)
6. Miscellaneous	5	(9.2)

1. *Maturation Arrest*

In this group, arrest at some stage of spermatogenesis was observed. The most characteristic feature observed in this group was the absence of germinal epithelial cells predominantly beyond the stage of primary spermatocytes and to a

*Lecturer, Department of Pathology and Microbiology.

**Reader, Department of Pathology and Microbiology.

***Professor and Head of Department of Pathology and Bacteriology.

****Reader in Department of Pathology and Microbiology.

From Sardar Patel Medical College, Bikaner.

lesser extent, of secondary spermatocytes and spermatids.

2. *Peritubular Fibrosis*

In this group, the seminiferous tubules were markedly reduced in size and were surrounded by variable amount of fibrous tissue. The reduction in the tubular size was apparently related to the amount of peritubular fibrosis.

3. *Sertoli Cell Only Syndrome*

These cases revealed complete absence of germinal cells in almost every tubule and was a uniform feature in all the cases. Other structural components, as basement membrane, tunica propria and interstitial tissue as well as blood vessels appeared normal.

4. *Tubular Hyalinization*

The most characteristic abnormality of this group was, however, the hyalinization of the walls of some of the tubules. The tubular architecture was completely destroyed by extensive interstitial and peritubular fibrosis. The tubules were reduced in size and their inner surface showed complete absence of lining epithelium.

5. *Normal Spermatogenesis*

All the structural components of the testes including the tubules, interstitial tissue and blood vessels showed retention of the normal morphological appearance.

6. *Miscellaneous*

In this group, cases were included in which morphological features did not fit in any of the group mentioned. In 1 of the 5 cases, the tubular architecture was completely lost. A few tubules of very small diameter was discrenible. In the second case, tubular architecture was normal. In most of the tubules, maturation arrest was present. The rest of 3 cases of this group were characterised by mild to moderate degree of mononuclear cell infiltration in the interstitium.

Discussion

Study of the morphological features of the testicular biopsy material has revealed 6 types of morphological patterns in these cases. A similar morphological pattern has been reported by previous workers (Engle 1947; Nelson and Heller 1953; Malhotra and Deo 1966; Girgis and Anwar Effriby 1969 and Wong *et al* 1973). The morphological patterns observed in 54 testicular biopsis from cases of male infertility are; (i) maturation arrest, (ii) peritubular fibrosis, (iii) Sertoli cell only syndrome, (iv) tubular hyalinization, (v) normal spermatogenesis and (vi) miscellaneous group. Out of these, maturation arrest was observed in 35.2% and peritubular fibrosis in 29.5% cases. Thus, these two main patterns represented the major histological changes in 65% of the cases. The remaining patterns alongwith a combination of these were found in only one third of the subjects.

Though a number of factors have been held responsible for the development of testicular failure, as congenital, inflammatory occlusion of the efferent ducts, constitutional defects, exposure to radiation, pitutary failure and mumps orchitis. But, in the present study no exact cause of infertility could be pin-pointedly corelated with the morphological features. The failure to locate a specific cause in such cases is understandable in view of the fact that the same kind of morphological lesion can be produced by different kinds of histological lesions under different circumstances.

From these observations, it is clear that the scope of testicular biopsy in defining the exact cause of testicular failure is

limited. This does not mean to imply that testicular biopsy should not be done routinely in every case of male infertility for though the diagnostic use of the testicular biopsy may be limited, the value of this procedure can not be ignored (Charny 1940;Heller and Nelson 1948; and Howard and Simmons 1951).

Summary

Histological studies of testicular biopsy material revealed 6 histopathological patterns namely; maturation arrest, peritubular fibrosis, Sertoli cell only syndrome, tubular hyalinization, normal spermatogenesis and miscellaneous group. Of these maturation arrest and peritubular fibrosis, constituted the predominant histological patterns in the present study.

References

1. Charney, C. W.: J. Am. Med. Assoc 115: 1429, 1940.
2. Engle, E. T. and Ling, M. E.: Ann. N.G. Academic Sciences. 22: 619, 1952.
3. Girgis, M. S. and Anwar Efriby, I.: Fert. Steril. 20: 467, 1969.
4. Heller, C. G. and Nelson W. O.: J. Clin. Endocrinol. 8: 345, 1948.
5. Hotchkiss, R. D.: Arch. Biochem. **16**: 131, 1948.
6. Howard, R. P. and Simmons, P. A., Sniffen, R. C.: Fertil. Steril. 2: 95, 1951.
7. Jan, E. J. and Jon Raboch: Pertil. Steril. **14**: 237, 1963.
8. Malhotra, K. K. and Deo, M. G.: J. Assoc. Physicians India. 14: 575, 1969.
9. Nelson, W. O. and Heller, C. G.: Ann. Rev. 2: 179, 1951.
10. Paulsen, C. A.: The Testes in Williams, R. H. Textbook of Endocrinology. Ed. 4, W. B., Saunders Co. Philadelphia 1968, pp. 405.
11. Simmons, P. A.: N. Eng. J. Med. 255: 1140, 1186, 1956.
12. Wong, T. W., F. H., Straus, F. H. and Warner, N. E.: Arch. Pathology. 95: 151, 1973.