TOTAL DOSE IRON-DEXTRAN THERAPY IN 184 CASES OF PREGNANCY ANAEMIA

by

B. C. Mehta,* M.R.C.P.E., M.A.M.S.

Kusum Jhaveri,** M.D., D.G.O.

and

J. C. Patel,*** B.Sc., M.D., M.R.C.P., Ph.D. (Lond.)

Iron deficiency anaemia is widely prevalent in our country (Mehta and Patel, 1968). Both sexes and all ages are susceptible but pregnancyi is a vulnerable period because of the increased demand of iron. Total dose iron-dextran therapy is one of the methods of correcting iron deficiency in the antenatal period. We report here our experience with this mode of therapy.

Material and Methods

Patients with haemoglobin below 11.0g% attending the antenatal clinic of Nowrosjee Wadia Maternity Hospital were taken up for the study. Haemoglobin was estimated by Sahli's method. Serum iron, iron binding capacity and plasma proteins were estimated by methods described earlier (Mehta and Patel, 1968).

The amount of iron-dextran required was calculated from the scales provided by the manufacturers. The required amount of iron-dextran was added to a bottle of saline and the drip was started at the rate of 10 drops per minute for 15 minutes. If no reactions occurred during this period, the rate of infusion was increased so that the whole infusion was over in about 45 minutes.

Side effects were recorded and haemoglobin was estimated at weekly intervals in cases who attended for follow-up. The haemoglobin was also estimated a day after delivery.

The duration of pregnancy at the time of therapy and parity are shown in Table I.

TABLE I

Duration of Pregnancy and Parity

Duration of pregnancy in weeks	No. of cases	Parity	No. of cases
<25	39	Primipara	52
26-30	114	2-3	65
31-35	20	4 or more	67
>35	11		

The initial haemoglobin was between 2.1 and 6.0 g% in 24 cases, between 6.1 and 9.0 g% in 117 cases and over 9.0 g% in 43 cases. Serum iron was less than 50.0 mcg% in 133

*Hon. Asst. Physician, King Edward VII Memorial Hospital, Bombay, (In charge of Hematology Clinic).

**Research Assistant.

***Honorary Consulting Physician, K.E.M. Hospital, Bombay.

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cases. Iron binding capacity was over 400 mcg% in 150 cases and transferrin saturation was 15% or less in 139 cases. Total serum proteins were 5.0 g% or less in 41 cases and serum albumin was 2.0 g% or less in 46 cases. Morphological findings in the bone marrow smear are shown in Table II.

TABLE II

Bone marrow Morphology

Bone marrow morphology	No. of cases
(i) No abnormality	52
(ii) Normoblasts suggestive of iron deficiency	3
(iii) Giant myelocytes, giant metamyelocytes and macronormoblasts	104
(iv) Megaloblasts	4
(v) (ii) + (iii)	6

The amount of iron-dextran administered ranged from 26-58 ml.

Results

The mean weekly rise of haemoglobin is shown in Table III.

Haemoglobin was estimated a day after delivery in 123 cases. Results are shown in Table IV.

TABLE IV

Haemoglobin Values a Day After Delivery

Period between TDI and delivery in days	Number of cases with haemoglobin	
	>11.0 g%	<11.0 g%
<28	7	11
29-56	11	9
57-84	29	10
>84	30	16

Local thrombophlebitis at the site of TDI was observed in 12 cases. Systemic side effects were encountered in 112 (62.2%) cases. Joint pains, fever, bodyache and backache were the common side effects (Table V).

During the trial, two batches of iron-dextran were used. Reaction with these two batches are shown in Table VI.

TABLE III

Mean Rise of Haemoglobin after Iron-dextran Therapy

Weeks after TDI	Haemoglobin rise in cases with initial haemoglobin of					
	2.1-6.0 g%		6.1-9.0 g%		9.1-10.9 g%	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
1	1.26 (15)	0.32	0.764 (84)	0.79	0.167 (27)	0.65
2	1.33 (6)	0.98	1.43 (6)	1.02	0.80 (5)	0.67
3	3.1 (5)	0.55	1.556 (27)	1.01	0.75 (6)	0.61
4	3.9 (5)	1.52	2.457 (23)	1.14	1.60 (10)	1.05
5	3.7 (5)	1.00	2.167 (24)	1.17	2.30 (5)	0.84
6	4.1 (5)	1.67	2.5 (13)	1.15	1.50 (12)	0.85
7	4.0 (2)	—	2.9 (20)	1.23	1.7 (5)	0.45
8	3.75 (4)	1.88	2.891 (23)	1.47	1.1 (5)	0.89

Figures in brackets indicate number of cases.

TABLE V

Side Effects of TDI

Side effects	No. of cases
Joint pains	59
Fever	38
Bodyache	31
Backache	21
Headache	26
Rash	15
Nausea	13
Itching	11
Vomiting	10
Diarrhoea	7
Chest pain and giddiness	each 8
Abdominal pain	5

TABLE VI

Variations in reactions with two batches of iron-dextran

	Iron-dextran	
	Batch I	Batch II
Total cases treated	95	89
Cases with reactions	68	44
Chi square	6.680	
P	<0.01	

Four patients had initial haemoglobin of 4.0, 4.5, 5.5 and 6.5 g% respectively. Bone marrow was not megaloblastic but showed giant metamyelocyte. Transferrin saturation ranged between 2 to 3%. In these 4 cases haemoglobin dropped to 3.5, 2.5, 4.5 and 2.5 g% respectively, 2, 4, 3 and 6 weeks after TDI. Bone marrow was re-examined at this stage and found to be frankly megaloblastic in all the 4 cases. They were given 15.0 mg. folic acid intramuscularly daily for a week. Haemoglobin increased to 8.5, 6.5, 8.5 and 8.0 g% respectively 2 weeks after starting folic acid therapy.

Four patients with initial haemoglobin levels of 4.0, 7.0, 7.0 and 10.0 g% had frankly megaloblastic bone marrow before therapy. Transferrin saturation in these cases was 70, 2, 3 and 74% respectively. All of them were given TDI. None of them received any folic acid or vitamin B_{12}. One of them (with initial haemoglobin of 4.0 g%) was lost to follow-up, whereas the other three had haemoglobin of 12.0, 11.5 and 12.0 g% at the time of delivery when their bone marrow showed giant metamyelocytes but no frank megaloblastosis.

Discussion

As iron deficiency is a common cause of anaemia in antenatal patients, total dose infusion of iron-dextran provides a convenient method of treatment. This method has the advantage of a short period of hospitalization. However, a very high incidence of systemic reactions as observed by us and reported by other workers from India (Bhagwanani *et al*, 1969; Bhatt *et al*, 1966; Elhence *et al*, 1966; Humphries, 1966; Kango and Varudkar, 1967; Lal *et al*, 1967; Mehta and Patel, 1968; Mehta *et al*, 1968; Nath and Omer, 1967; Prakash *et al*, 1966; Thaman and Dogra, 1966; Upadhyay and Mishra, 1967) is a drawback of the therapy. Reactions have been more in our country as compared to reports from England (Basu, 1965; Bonnar 1965; Varde, 1964). Reactions have also varied from place to place and from time to time in the same place. These variations may be partly explained by the different batches of the product used, as has been shown in Table VI.

Four patients showed a fall of haemoglobin level after TDI. Bone

marrow was frankly megaloblastic at this stage and all the four responded to folic acid administration. Bonnar (1965) has reported a similar experience with total dose iron therapy. Four patients who had frankly megaloblastic marrow at the outset were given TDI; on follow-up 3 patients showed satisfactory haemoglobin response.

It is difficult to predict from the initial haemoglobin, serum iron, transferrin saturation or bone marrow morphology as to which cases would fail to respond to TDI due to associated deficiencies. Though serum B_{12} and folate were not estimated in these cases, they also do not provide any guide as we have reported earlier (Mehta and Patel, 1968). This is because deficiencies of iron on the one hand and B_{12} and/or folic acid on the other hand produce diametrically opposite effects on red cell and bone marrow morphology, and also the serum levels of iron, B_{12} and folate are altered in different directions by deficiency of each of them (Mehta *et al* 1968). Correction of iron deficiency may stimulate appetite leading to quantitative and/or qualitative changes in diet and/or absorptive function of intestinal mucosa which might improve with correction of iron deficiency. This might be an explanation for the adequate response to TDI in 3 cases with megaloblastic marrow and in many other cases with giant metamyelocytes in the marrow.

In spite of total dose iron-dextran therapy, 46 patients (37.4%) had haemoglobin of less than 11.0 g% at the time of delivery. Such cases need to be studied in detail to determine the cause of this sub-optimal response.

Summary

Total dose iron-dextran was administered to 184 antenatal patients with haemoglobin below 11.0 g%. Systemic reactions were encountered in 112 (62.2%) cases. Four cases showed a fall of haemoglobin after therapy due to folic acid deficiency. Three patients with initial megaloblastic marrow responded satisfactorily to iron without any B_{12} or folic acid supplements. There were significant variations in incidence of reactions with two batches of iron-dextran. In spite of total dose iron therapy, 46 cases (37.4%) had haemoglobin below 11.0 g% at the time of delivery.

Acknowledgements

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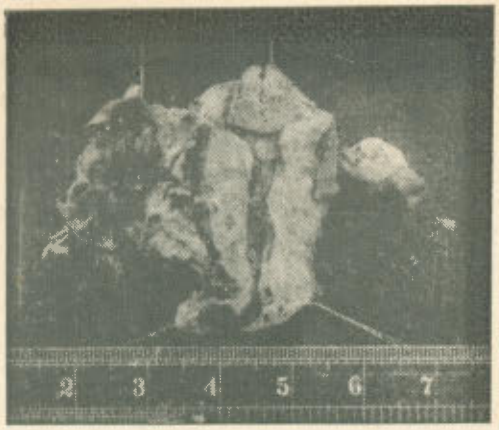

Fig. 1
Shows typical appearance of choriocarcinoma of ovary.

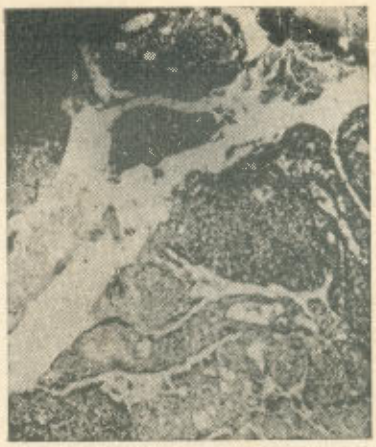

Fig. 2
H & E Reveals anaplastic trophoblastic cells seen amongst haemorrhagic tissue x 100.

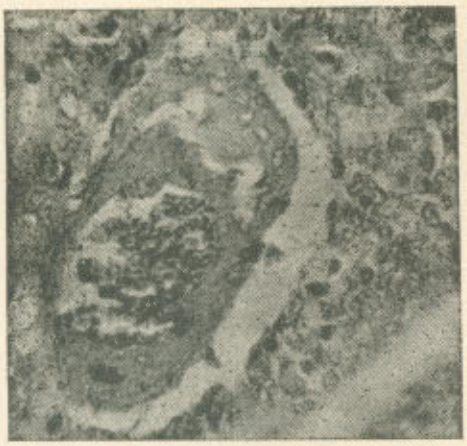

Fig. 3
H & E shows a tumour embolus of chorio carcinomatous cells in a vessel x 450.

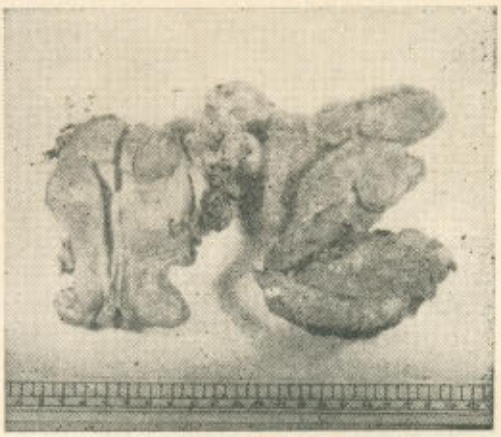

Fig. 4
Gross appearance of chorio carcinoma of fallopian tube which has been completely replaced by a haemorrhagic tumour.

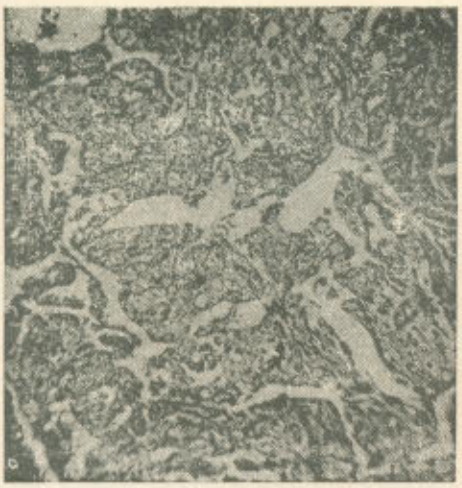

Fig. 5
H & E shows sheets of neoplastic cyto and

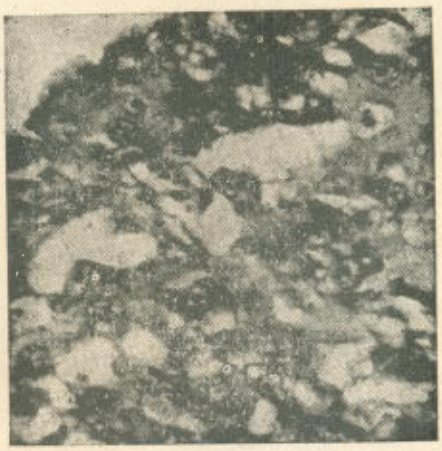

Fig. 6
Neoplastic syncytiotrophoblasts under a high

An Invisible Incision for Postpartum Tubal Ligation—Ramesh pp. 546-548

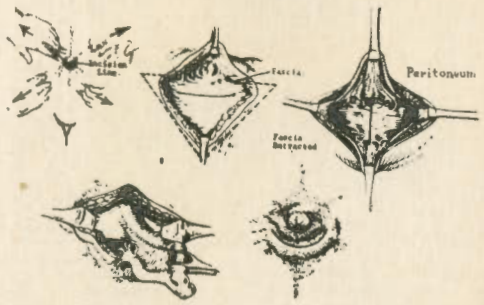

Fig. 1
Invisible incision:
A—Semicircular incision in stretched out peri-umbilical skin showing stretching in all the 4 directions by assistants.
B—Travanverse incision in the exposed fascia.
C—Retracted edges of fascia exposing the peritoneum-vertical incision in the peritoneum.
D—Exposure of the tube.
E—Reapproximated peri-umbilical skin.

Chorionepithelioma with Features of Ectopic Gestation—Mukherjee pp. 469-470

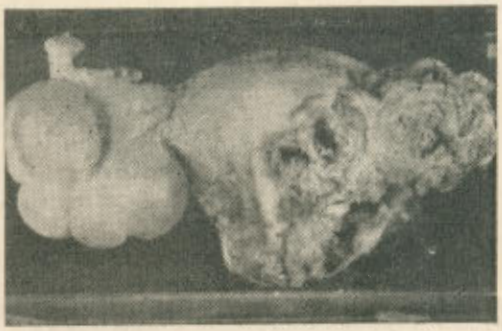

Fig. 1
Friable growth with spontaneous perforation on the right posterior aspect of the uterus and involving the right broad ligament (posterior view).

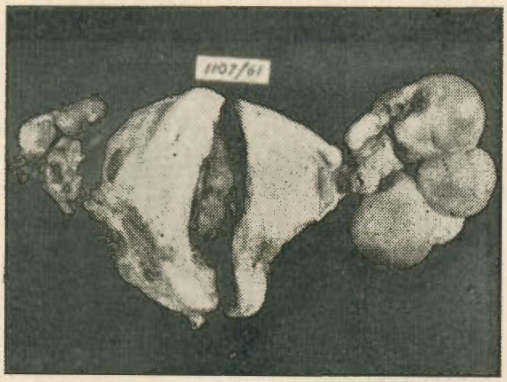

Fig. 2
Haemorrhagic polypoidal growth arising from right posterior wall of the uterus and protruding inside the uterine cavity (anterior view). Presence of bilateral theca lutein cysts of ovaries may be noted.

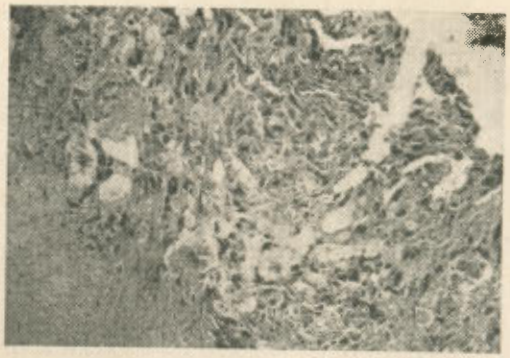

Fig. 3
Typical microscopic picture of choriocarcinoma consisting of both types of cells with haemorrhage and muscle destruction (x 100).

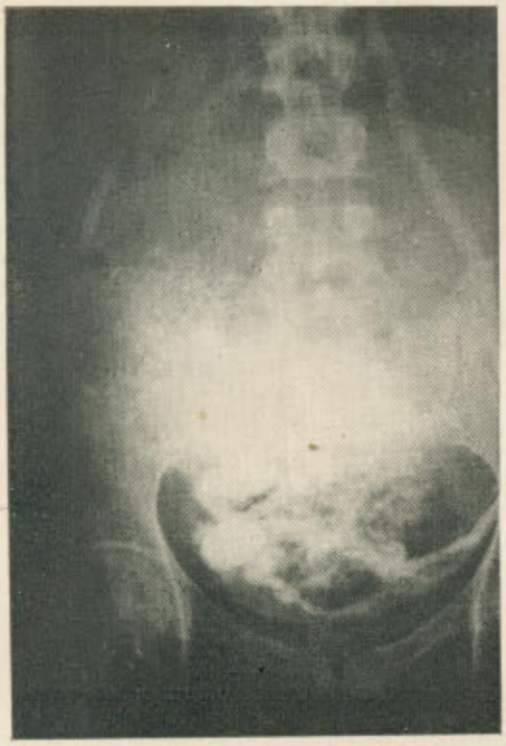

Fig. 1
Showing the honey comb appearance due to diffusion of the dye throughout the uterus with vesicles appearing as filling defects.

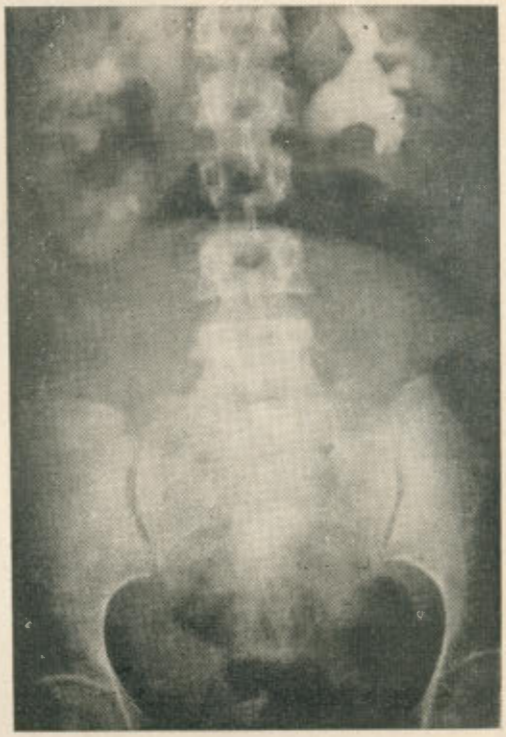

Fig. 2
Second film taken after 25 minutes of injection showing the pyelogram.

Fig. 3
Shows peripheral diffusion of the dye with a central cavity.

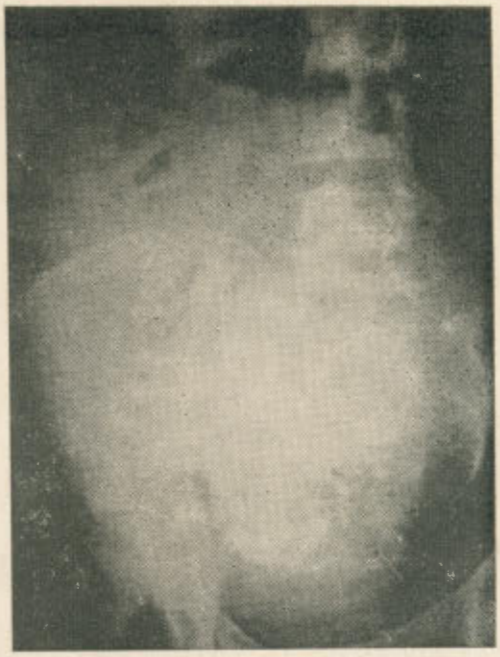

Fig. 4
Oblique view of the same patient showing the diffusion of dye.

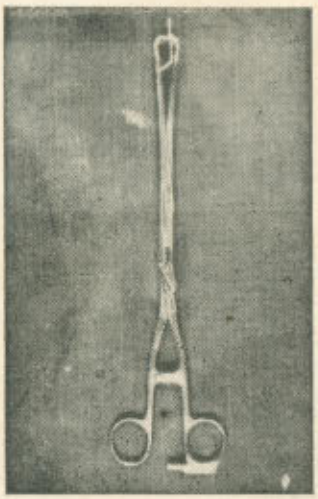

Fig. 1
Japanese design cannula.

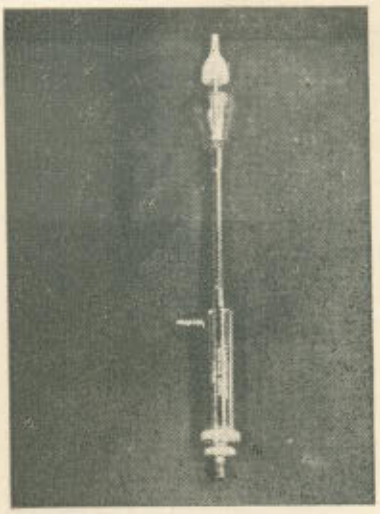

Fig. 2
Malmstrom's cannula.

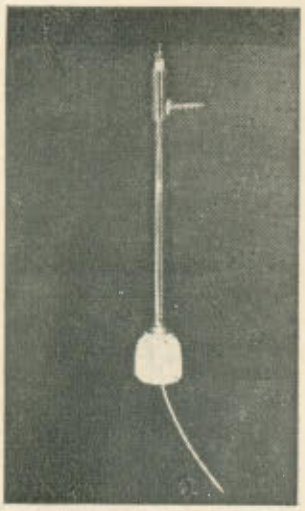

Fig. 3
Soonawalla's cannula

Fig. 3a
Hysterogram with Soonawalla's cannula.

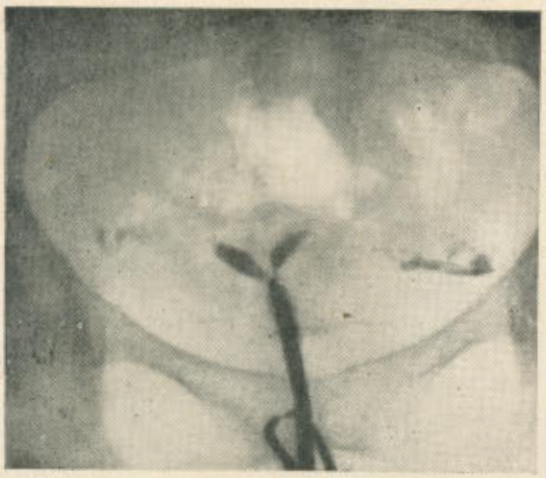

Fig. 4a
Uterine bifidity with hypoplasia.

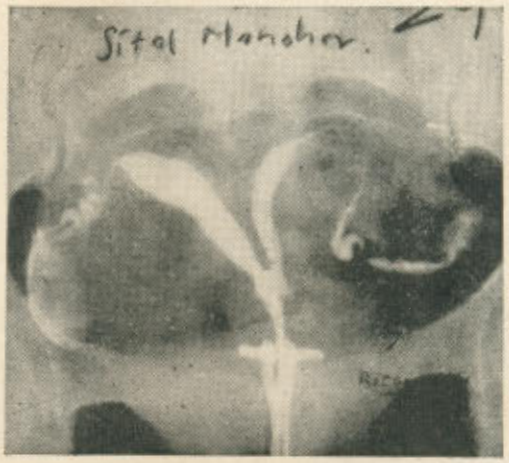

Fig. 4b
Double uteri.

Fig. 5a
Axial rotation of uterus.

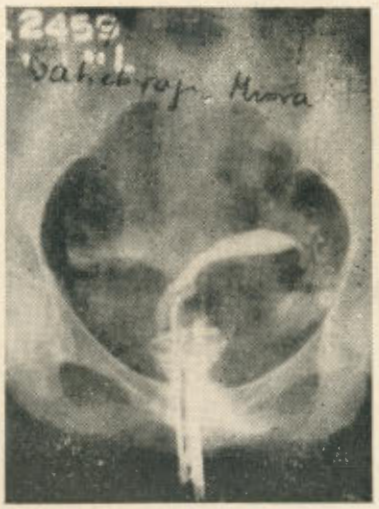

Fig. 5b
Unicornuate uterus.

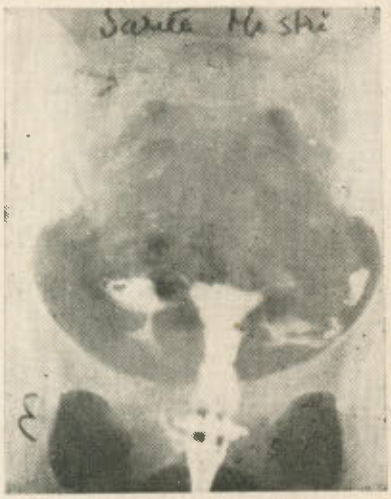

Fig. 6
Incompetent cervical os.

Fig. 7
Uterine synaechia with cervical incompetency.

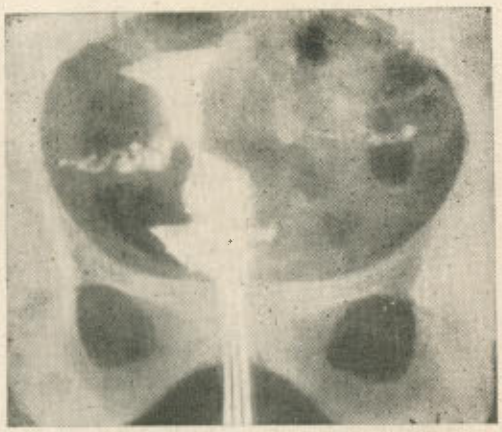

Fig. 8
Dilated fenestrated cervix.

Epidermoid Carcinoma of the Body of the Uterus—Daruwala and Vijaykar pp. 563-565

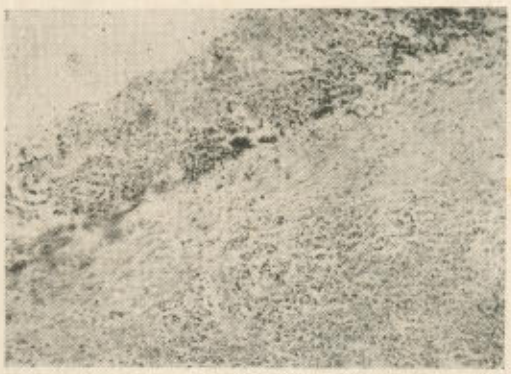

Fig. 1
Showing complete replacement by stratified epithelium.

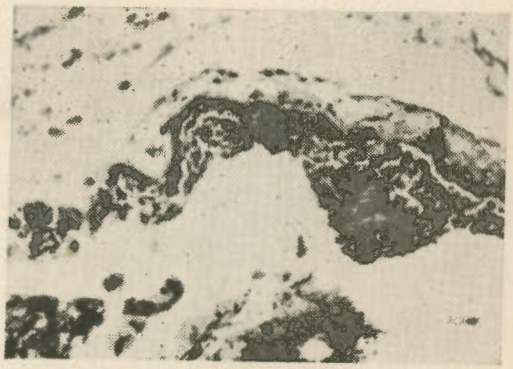

Fig. 1
Amnion nodosum.

Fig. 2
Inflamating cells are lining the roof of the intervellous space amnion and chorion are also involved.

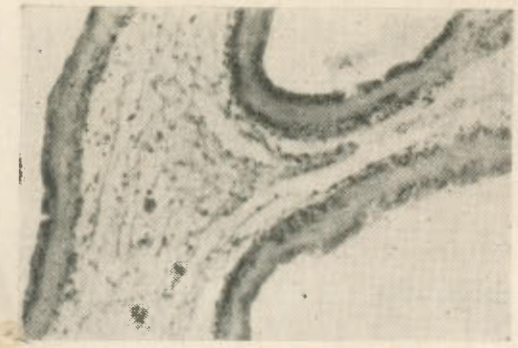

Fig. 3
Amniotitis.

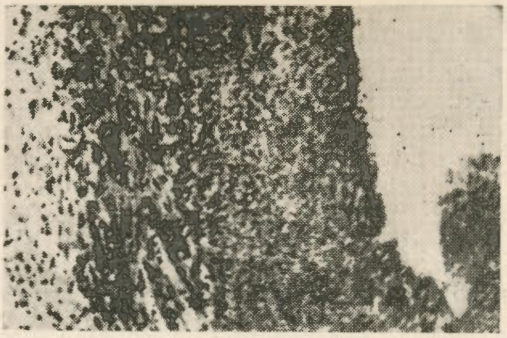

Fig. 4
Vasculitis of the umbilical cord stage iv.

Herniation of Retroverted Gravid Uterus through the Pouch—Sharma and Wakhaloo pp. 551-553

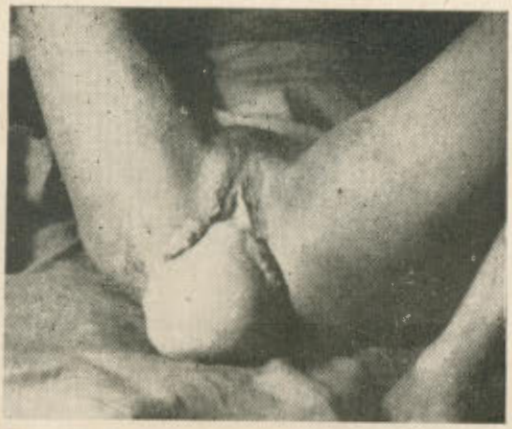

Fig. 1
Showing the anterior view of the herniated uterus.

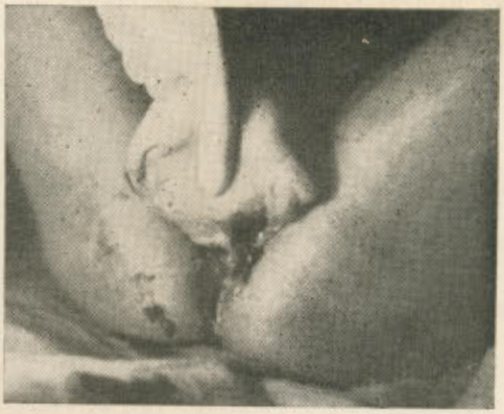

Fig. 2
Showing the posterior view to the herniated uterus.

Full Term Ovarian Pregnancy with Healthy Infant—Chaphekar pp. 554-557

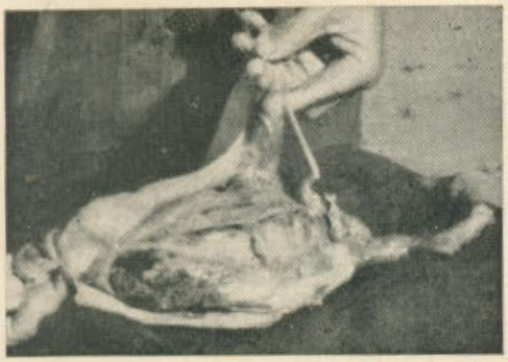

Fig. 1
Placenta from the case of full term ovarian pregnancy. A probe has been passed through the normal fallopian tube. Hypertrophied ovarian vessels are seen. On the left side, fingers of the operator lift up three small nodules of ovarian tissue in the wall of the sac. On the right are the cut ends of the ovarian ligament and the umbilical cord.

Fig. 2
Placenta of the case of full term ovarian pregnancy. Section of the maternal surface of the placenta. Shows the compressed ovarian tissue above and the placental tissue below (x 140).

Leiomyosarcoma of the Broad Ligament—Mehra et al pp. 572-574

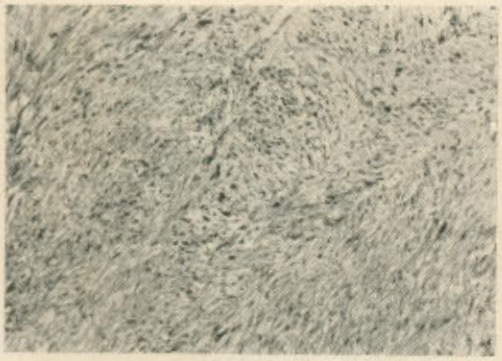

Fig. 1
Shows the structure of the leiomyosarcoma with plenty of atypical cells.

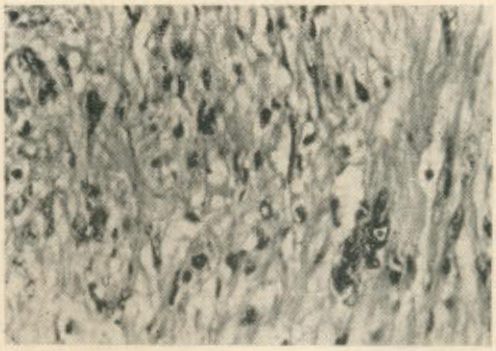

Fig. 2
Higher magnification showing the pleomorphic picture and bizarre nuclear morphology.