Perhaps the most acceptable hypothesis is that of a conscious or unconscious association of ideas linking up certain pain stimuli with concepts or recollections of a sexual nature. These latter may be so intense as virtually to swamp the pain sensation and produce a temporary analgesia.

Havelock Ellis has discussed at length and with great clearness the probable mechanisms underlying the masochistic phenomena. He points out that in algolagnia the pain in question is less important than the violent emotional outburst; that the pain endured is never intense, and is usually, if not always, bound up with sexual activity; divorced therefrom, pain is no longer pleasurable. The sufferings experienced by a woman in association with sexual excitement may be gratifying in that they enhance the dominant and assertive characters which she appreciates in her male.

Krafft-Ebing summarizes the problem thus: "The person in a state of masochistic ecstasy feels no pain. When a woman says that she finds pleasure in the pain inflicted by a lover, she means that under the special circumstances she finds pleasure in treatment which would at other times be felt as pain. Or else that the slight pain experienced is so quickly followed by overwhelming pleasure that in memory the pain itself seems to have been pleasure, and may even be regarded as the symbol of pleasure."

PHYSICAL EFFICIENCY AFTER OPERATIONS FOR HERNIA *

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The simple title of this discussion is, I think, no index of the extent of the subject. It certainly involves the primary consideration of the problems of detailed technique for the effective radical cure of various types of hernia; but in addition wider considerations, such as the bearing of age and the physical type operated on, repair processes in muscle, and aponeurosis, and recovery of body function, and the importance of the psychical element in this relationship must be included.

The practical surgeon will in the first place wish to determine what type of operation is most likely to be effective in producing a lasting cure in the individual case. Indeed, the successful closure of the hernial opening will generally be admitted as being of the first importance in restoring the physical efficiency of the patient. The types of hernia to be considered are inguinal, femoral, umbilical, and incisional and traumatic. A superficial examination of records shows that the incidence of inguinal hernia is much greater than that of any other type. For example, in five years' operations for hernia at St. Thomas's Hospital the approximate proportions were 11 inguinal hernias to 1.4 femoral and 1 ventral. I shall therefore take as my text inguinal hernia. I propose to analyse the published results of operation for this condition and refer to my own experience of it, leaving it to those who follow to fill in gaps and comment on my argument.

Treatment of Inguinal Hernia

The radical treatment of inguinal hernia will be admitted as having been on a sound basis since the introduction of Bassini's method in 1890. Since that date many modifications of technique have been put forward, and some have found a permanent place in surgical

practice. Bassini's method and the others that followed him were based on the principle of obliterating the sac and reinforcing, rather than reconstructing, the musculature which closes the inguinal canal. The next important advance was the use of the fascial suture or graft, a procedure which enables the surgeon in some degree to neglect the normal muscle closure of the canal and to substitute a fibrous diaphragm: this procedure is particularly adapted to the treatment of direct hernias, but its use for indirect hernias has advocates.

It might be thought that, in view of the amount of consideration given to the subject and the great bulk of cases which have been operated on, a common standpoint as to the best methods and their effectiveness would have been reached by now. This is, however, by no means the case. Inadequate or inaccurate information as to the late results of various operations is mainly responsible for this state of affairs. It is only in the last five or ten years that any systematic attempts to follow up hernia operations have been made. Even then in the figures resulting from such investigations one finds difficulty in assessing their proper value. The methods and standards of classification vary widely, and in all groups of figures there is a certain percentage of untraced cases which clearly weakens the value of any results arrived at. A further difficulty is that of estimating the value of new methods on account of the relatively small numbers reviewed and the shortness of the period of observation.

Assessment of Results

In discussions between surgeons on the end-results of hernia operations, the general impression to be gathered is that the individual surgeon using the method he favours seldom sees recurrences. No doubt there is a tendency for failures to be seen by surgeons other than those who first operated, but I cannot help thinking that a close and critical follow-up of all cases would show a much higher recurrence incidence than we believe to exist.

My own confidence in the satisfactory nature of results of inguinal hernia operations was shaken by my experience as consulting surgeon to the metropolitan police. Here we are dealing with a body of men some 20,000 strong, of picked physical efficiency, and young to middle-aged. The force, on the whole, is not exposed to excessive physical exertion. One would therefore expect a high standard of permanent cures after radical operations. The figures I have collected in relation to this group are small, but appear to be fairly constant each year. In the five-year period 1929-34 241 police officers were operated on for inguinal hernia. In 212 cases the operation was primary, the condition being double in fifteen. Four operations were for strangulated hernia. Twenty-five operations were for recurrences, which suggests an approximate recurrence rate of at least 11.5 per cent. In order to investigate the matter more fully I asked my first assistant, Mr. N. R. Barrett, to follow up and examine personally all cases of this type operated on at St. Thomas's Hospital for the previous five-year period. This investigation showed the incidence of recurrence to be even higher than this figure, and I will refer in detail to his findings later.

In the literature the most important statistical analysis of this subject is to be found in an article by Block.¹ He published in 1933 the collected results of 20,199 inguinal hernia operations. His figures were obtained from 650 different surgeons working in German clinics. The results he quotes are essentially of a bulk character, as he does not show the incidence of recurrence in relation to sex, age, or anatomical type of hernia. He himself recognizes that the estimate of recurrence varies with the individual observer. What one surgeon would term a weak inguinal region another would classify as a recurrent direct hernia.

* Read in opening a discussion in the Section of Surgery at the Annual Meeting of the British Medical Association, Bournemouth, 1934.

None the less, the material considered is very large, and the figures resulting may be taken fairly to represent the present ideas on the Continent of the recurrence incidence. Of the total 20,000-odd cases reported only 6,029 were followed up for a period of two years or more. In this group 296 recurrences were reported. This recurrence incidence he analysed in relation to type of operation carried out, with the following result.

Recurrence Rate

Method	Total Cases	Cases Followed	Incidence of Recurrence
Bassini	13,220	4,177	177 = 4.2 per cent.
Gerard	1,857	559	32 = 5.7 "
Kocher	1,338	221	7 = 3.2 "
Hackenbruch ...	1,026	514	49 = 9.5 "

Results from smaller groups of figures are omitted.

He estimated the time of recurrence from personal investigation of 642 cases, the results being as follows:

Time of Recurrence in 642 Cases

Inside three months	131 = 21.3 per cent.
For next three months	109 = 16.9 " "
For next six months	94 = 14.6 " "
One to two years	68 = 10.5 " "
After two years	224 = 34.8 " "
Unknown	16 = 1.5 " "

It is interesting to note that no less than 34.8 per cent. of recurrences occurred in this group after two years. In a large number of published cases the investigation has not been carried on sufficiently long after operation to include this group.

In the same group the cause of recurrence was put down by Block to the following factors in 548 cases in which the information was available:

Cause of Recurrence

Suppuration or wound haematoma	122
Pulmonary complications	79
Technical errors in operation	27
Double-sided operation	102
Constitutional defect and poor connective tissue ...	149
No observed cause	69

Is Recurrence Avoidable?

Block states that in his opinion 40 to 45 per cent. of recurrences are avoidable, and emphasizes the important influence in this direction of a double operation carried out at one sitting. The nature of the recurrence in the group investigated is shown in the following table:

Situation of Recurrence

Inner part of scar	286
Outer part of scar	170
Middle part of scar	8
Unknown	3
Total	467

Although it is of interest to discover the exact nature of a recurrence after an operation for indirect hernia, I find it very difficult from published records to come to any definite conclusion on the subject. Certainly the majority of recurrences are not properly oblique or into remains of the original sac. Block's figures suggest that the majority of recurrences are internal direct hernias, and that is consistent with my observations (from a clinical standpoint) in a group of policemen.

Another matter of interest and perhaps practical importance drawn from these figures is the routine period for which hernia cases are kept recumbent after operation, the following being the report from fifty-five different clinics.

Length of Stay in Bed

Number of Clinics	Period of Recumbency.
1	1 day
1	4 to 6 days
2	7 days
36	In second week
12	After two weeks
3	After three weeks

Block, though he finds no obvious ratio to exist between the period of post-operative recumbency and the recurrence incidence, makes the statement that, though the time of return to work varies considerably, it appears to be latest in those patients who get up soonest after operation.

An analysis of the suture material used in relation to the recurrence incidence suggests that it has little or no influence on the results. The figures are as follows:

Effect of Suture Material

Material Used	Clinics Reporting	Cases	Recurrence Incidence
Catgut	36	7,980	4.3 per cent.
Silk	26	7,809	4.3 "
Thread	7	2,626	4.6 "
Silkworm	1	113	5.3 "

(The total death rate in this large group, excluding cases of strangulated hernia, was 0.5 per cent.)

Block was unable satisfactorily to determine the relationship of recurrence incidence to the experience of the operator. He notices in the cases of recurrence that the ratio of manual workers to sedentary workers is as 6 to 1.

Discussion

I have given in some detail the results of this investigation, as from the large number investigated they must carry considerable weight in forming a general surgical opinion in this subject. I should like, however, to emphasize certain criticisms as to their validity in assessing the recurrence incidence after operations for adult inguinal hernias. First, hernias in women and children are included in all results. By common consent the ratio of satisfactory cure in these cases is high. Secondly, only about three-tenths of the cases reviewed have been followed up, and of the group of 6,000 subjected to late examination few were traced for more than two years after operation.

From America the figures of Gibson and Felter² may be taken as representative of modern optimistic ideas. They conclude that in a group of patients numbering 1,618, the general recurrence rate is 2.9 per cent. For direct hernia they estimate it at 6.5 per cent., and give the astonishing figure of 1.3 per cent. for indirect hernias. It is of interest to note that they found the recurrence rate after double operations for indirect hernia to be 8.9 per cent. It should be noted that these figures were obtained from a quite inadequate follow-up; only sixty-seven cases were examined after two years.

Many reports of smaller groups of cases are to be found, most of them are designed to illustrate the results of some special technique. Bessin³ reports on 4,500 cases operated on by Kirschner's modification of Bassini's method. He followed up, in 1932, 267 male cases of all types operated on in 1928, and found ten recurrences (4.13 per cent.). Six of the recurrences appeared in patients in whom the wound had supplicated, or who had suffered from post-operative pulmonary complications. He noted that atrophy of the testicle was not observed in any instance. Ostfeld⁴ records 586 cases operated on by the Bassini

method, silk being used for preference as suture material; 239 cases were followed up, and the general recurrence rate was found to be 5.4 per cent. For indirect hernias the figures were 4.3 per cent., and for direct hernias 20 per cent. He noted that if the period of post-operative recumbency was limited to six days no increase in the recurrence incidence was noted. He finds that a hereditary influence doubles the likelihood of recurrence. Niessen⁵ reports on 102 cases operated on by Schmieden's technique. In the sixty-six cases followed up there were six recurrences in men between the ages of 40 and 60. This method involves displacement of the cord, and it is worth noticing that in four atrophy of the testis followed, and that twelve cases complained of pain in the scar. I have not been able to find much in the way of figures from English sources. Turner and Eckhoff⁶ reported a small group in 1929. In ninety-eight cases simple excision of the sac was carried out, and gave only three recurrences. In twelve cases in which a modified Bassini operation was employed there were two recurrences.

An almost refreshing note in this welter of satisfactory results is sounded by Birkenfeld.⁷ He is concerned to show the association of hereditary tendency to the incidence of recurrence, and in seventy-six males followed up found a recurrence rate of 28.49 per cent. I think that the average results in the adult male are better represented by this figure than those previously quoted, although it seems incredibly high in comparison with the previous figures. N. R. Barrett recently examined for me 206 policemen out of a group of 295 who had been operated on between 1925 and 1929. Their average age was 32.5 years. The follow-up varied from five to nine years. In this group the recurrence incidence was 20.2 per cent. for indirect hernia, and 25 per cent. for direct. The average age of the men concerned was 31. In seven cases the recurrence appeared four or more years after the primary operation. In the forty-seven cases of recurrence bilateral hernia had been present and was operated on at one sitting. It may be noted that physical efficiency of many of the men was not sufficiently affected by the recurrence to prevent them carrying on with their duty. Twenty-six of the forty-seven came into this category, and of these only fourteen were wearing a truss.

Use of Fascial Suture

The use of autogenous fascia for suture was introduced, I believe, in 1904 by McArthur.⁸ The method has been elaborated by several authors, but now the technique introduced by Gallie and Le Mesurier⁹ appears to be the most satisfactory. The articles written in relation to this technique are multiple in number, but lack weight in the proportion of cases followed up for any length of time. The reason for this is probably that the fascial graft operation is reserved by most surgeons for direct, difficult, or recurrent cases. The theoretical case for the regular use of fascial sutures is put forward by Seelig and Chauke, and supported by Koontz. The latter thinks that preserved fascia is as efficient as fresh. They have shown that in reconstruction operations in the abdominal wall muscle and fascia sutured together with ordinary material do not unite. Koontz agreed to this, but states that if surfaces are first eroded union may be effected. This subject is reviewed by Hodgkins.¹¹

Of the figures bearing on this technique those of Gallie and Le Mesurier, published in 1930,¹⁰ may be noted. In 200 operations on direct and large indirect hernias they noted only four recurrences: all these recurrences appeared in bilateral cases. Lyle¹² reports on 159 bilateral cases followed for from one and a half to five and a half years on 132 cases operated on by the McArthur method and twenty-seven by Gallie's. He found 3 per cent. of recur-

rences in indirect hernia and 9.5 per cent. in direct. He states that in a group of operations carried out in the same period with catgut the recurrence incidence was twice as high.

Conclusion

I feel I have been guilty of firing off a lot of statistics, and when I come to an end I really do not quite know what I want to prove. The astonishing difference between the results that are indicated by these figures can hardly be laid at the door of any special technique. My own conviction is that recurrence after operation in the young to middle-aged is commoner and more difficult to avoid than we are inclined to think. When we come to consider how results are to be improved we are on thorny ground. The factors influencing success may be considered under the following headings:

1. Technical method.
2. Failures in technique, including suppuration and haematoma formation.
3. Post-operative pulmonary complications.
4. Operation on double hernias.
5. Hereditary tendency to hernia, or congenital feebleness of the musculature.

As opener of the discussion I shall refrain from commenting further on these points, as those who follow me will no doubt have clear ideas as to how some, at any rate, of these various pitfalls may be evaded.

Femoral and Ventral Hernia.—I have spent so much time on inguinal hernia that I shall only refer briefly to femoral and ventral herniae. I take it that in considering the closure of the femoral canal discussion will mainly range round the question of closing the femoral canal from above or below. I confess to belonging to the old-fashioned group, which thinks that a closure from below by Langenbeck's method gives as good results as any. I take it for granted that the stump of the sac is satisfactorily reduced within the abdomen, and that the crural canal is cleared of fat before the pectinal fascia is sutured to Poupart's ligament. I admit the apparent attractiveness of the upper shuttle type of operation, but remain unconvinced that it is the better routine procedure. The association of femoral with inguinal hernia is sometimes emphasized. No doubt, if at an operation for inguinal hernia Poupart's ligament is forcibly pulled upwards the crural canal is opened to some degree. The subject is elaborated by Hodgkins.¹¹ In a group of ventral hernias, whether they be umbilical, epigastric, or incisional, I think the operation must be worked out for the individual case. I confess my belief in the value of certain principles. They should be closed by fascia without undue tension, unless muscle is sufficiently adjacent to repair the gap without it being necessary to pull it out of its normal line of action. A fascial repair should be effected by a double overlap. When tension does not admit of this a fascial graft suture should be employed.

I trust that if my primary presentation of this subject was too paralytically statistical my final categorical statements will prove useful material for discussion.

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