ORIGINAL PAPER

RJME
Romanian Journal of Morphology & Embryology
http://www.rjme.ro/

The arthroscopy-histological criterion link in the result's estimation of the endoscopic treatment by resection of the knee's meniscus lesions

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Abstract

The authors present the results of a statistical, clinical, imaging X-ray and optical microscopic studies of some lesions of knee's meniscus, the arthroscopy allowing this structure's biopsy during the endoscopic procedures of resection. These histological criterions are very important estimation factors of long-term results of these techniques, often the microstructure looking different to the appearing normal macroscopic aspect.

Keywords: arthroscopy, biopsy, meniscus, resection, microstructure.

Introduction

The arthroscopy is a modern method of diagnosis and therapeutic approach of many knee affections, of various etiologies, the meniscus lesions representing, by their high incidence and possible belated complications, as extremely serious medical problem but which can be very well solved by endoscopic surgical procedures.

Nevertheless we have considered that the macroscopic, global approach of the knee structures, achieved both directly, by means of the arthroscopy and indirectly, by clinical–evolutional and radiological criteria, is insufficient to establish the local tissue morphology, an important etiopathogenic factor and of prognostic assessment of the knee intra-articular lesions, both meniscal and chondral, ligamentous and synovial.

Materials and Methods

Our patients' group is composed by 1784 persons who were operated on the knee through the arthroscopic method, between the years 2000 and 2008.

The arthroscopic surgical techniques studied have been the partial meniscectomy, applied in the meniscal lesions from the non-vascularized area.

We have made a statistical, clinical, imaging X-ray and optical microscopic studies to the patients who went through such arthroscopic procedure, in order to establish a short and long term too prognosis about these kinds of meniscal lesions.

By the microscopic study of the structure of the meniscus where there has been an endoscopic intervention, we have pursued to obtain some data regarding the vascularisation, trophicity and implicitly its mechanical resistance, thus having some prognostic elements of the lesion. This long-term evolutional prognostic is directly related to the meniscal lesion, but indirectly it aims at the subsequent status of the hyaline articulation cartilage, which is closely related, as proven, to the protective role that a biological meniscus offers to it.

The fragments of meniscal tissues have been collected on the occasion of an endoscopic procedure applied on the meniscus lesion, from an undamaged macroscopic area, with the purpose of emphasizing the local microstructure, to what degree it has been affected and secondarily the mechanical resistance of that meniscus. Knowing these microstructural details of the meniscus interested in the traumatic and/or degenerative factor, one can estimate in the end its capacity of exerting its essential physiological role, namely its "protective" function, from the mechanical point of view, of the femur-tibia cartilage.

The histological study of the micro-parts collected endoscopically was done in optical microscopy, HE tint.

Results

Statistical study

While analyzing the statistical data from the group of patients operated through the arthroscopic method, it is necessary to stress the prevalence of the meniscal lesions (57.84%) and of the chondral lesions (67.26%),

considered the main surgical problem of the knee, especially in adult patients (Figure 1).

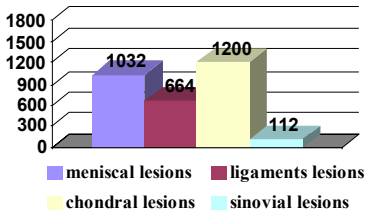

Figure 1 – *The general morbidity structure.*

By analyzing the place of the meniscal lesion, we notice the prevalence of the internal meniscus tears (800 cases – 77.52%), as compared to the external meniscus tears (152 cases – 14.73%), but also the presence of the "double" meniscal lesion (80 cases – 7.75%). The meniscal lesions have shown up isolated or associated with other types of intra-articular lesions (anterior cruciate ligament – ACL, or articular cartilage) (Table 1). The reasons for studying these associations are given by the differences in the therapeutic attitude, in the post-surgery recovery and especially in the prognostication for these patients.

Table1 – *Lesion's associations in meniscal tears*

Lesion	Age under 45 years		Age over 45 years	
	No. of cases	*%*	*No. of cases*	*%*
Isolated meniscal tear	88	11.71	8	2.87
Meniscal and cartilage lesion	232	30.85	240	85.71
Meniscal and ACL lesion	72	9.57	0	0
Meniscal, cartilage and ACL lesion	360	47.87	32	11.42

The degree in which the articular cartilage is affected also varies between the two age groups; among the young age group the incipient lesions, degrees I and II, are prevalent (416 cases of 592 – 70.27%), while in the age group of more than 45-year-old, the tardive chondral lesions are prevalent, in an even larger percentage, degrees III and IV (170 cases of 200 – 85%) (Figure 2).

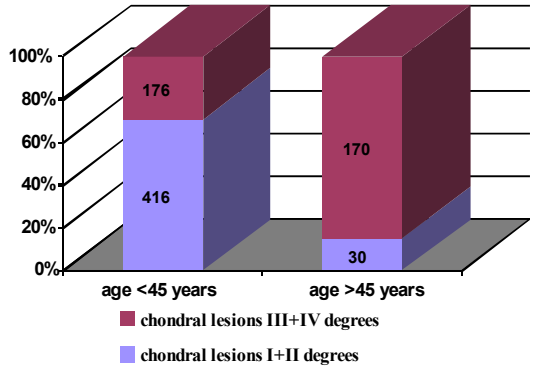

Figure 2 – *The association of the meniscal lesions with the chondral ones (on degrees) on age groups.*

We have proven the appreciation of the value of arthroscopy as a diagnosis method in a comparative study of the pre- and post-surgery diagnosis. The pre-surgery diagnosis was the one made upon the admission of the patient, based on clinical criteria and sometimes even imagistic RMN criteria, the radiological exploration not having any contribution in the case of the meniscal lesions. The post-surgery diagnosis was the one made concrete by through the arthroscopic exploration.

The clinical diagnosis of meniscal lesion has been noted for 1409 patients (78.90%), the arthroscopy noticing the presence of a meniscus tear, in various forms and places, at only 1032 patients (57.84%) (Figure 3).

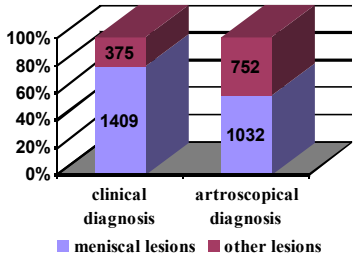

Figure 3 – *Correlations between the pre- and post-surgery diagnosis of the meniscal lesions.*

Meniscectomy in the meniscal lesions

The principle

Most of the meniscal lesions have been suited to resection, obeying the principle of the parsimony of the meniscal sacrifice, which is possible with maximum efficiency only through the arthroscopic technique.

The cases

The group of patients who suffered a meniscal resection comprises 937 people, most of them below the age of 45 years (657 cases – 70.11%), having various types of meniscal lesions (Table 2).

Table 2 – *Types of meniscal lesions*

Meniscal lesion	Age under 45 years		Age over 45 years	
	No. of cases	*%*	*No. of cases*	*%*
Longitudinal	238	36.22	15	5.36
Oblique	43	6.55	29	10.36
Radial	304	4.56	4	1.43
Horizontal cleavage	24	3.65	11	3.93
Complex	322	49.02	221	78.92

A significant difference can be seen between the two age groups with regards to the occurrence of each type of lesion; we thus notice that in the case of the people below 45-year-old the combined and longitudinal tears are prevalent (Figure 4) (85.24%), while in the case of the patients over 45-year-old only the complex lesions (Figure 5) can be found in 78.92%.

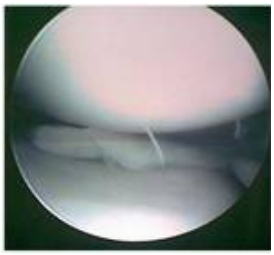

Figure 4 – *"Parrot beak" tear of the internal meniscus (35-year-old patient).*

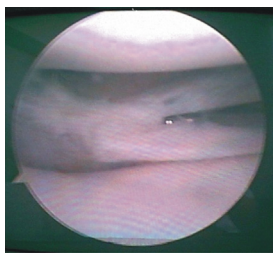

Figure 5 – *Complex meniscal tear (45-year-old patient).*

The arthroscopic surgical technique in meniscectomy

The arthroscopic intervention on this group of patients made a resection on the limit of the tear, keeping as much as possible from the undamaged meniscus and especially from its peripheral limit, in order to keep its functional surface.

Two types of meniscectomies have been performed (Figures 6 and 7), dictated by the type of tear (Table 3).

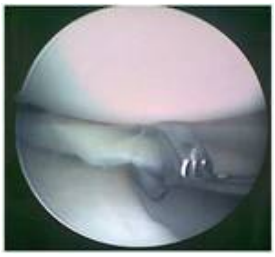

Figure 6 – ***The technique of the partial arthroscopic meniscectomy.***

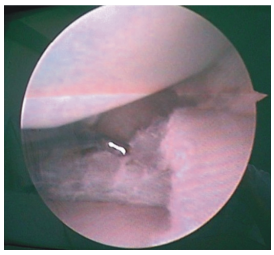

Figure 7 – ***Appearance after partial meniscectomy.***

Table 3 – ***Types of meniscectomy***

Meniscectomy	Age under 45 years		Age over 45 years	
	No. of cases	*%*	*No. of cases*	*%*
Partial	603	91.79	252	90
Subtotal	54	8.21	28	10

The intra- and post-surgery complications

We have been interested in pointing out the possibility of intra-surgery damaging of the articular cartilage, which occurs frequently during arthrotomy interventions. The group treated through arthroscopic resection had only nine cases of iatrogenic important chondral lesions, all of them on the surface and with a limited surface, with an occurrence of only 0.96%.

Post-surgery we have investigated the occurrence rate of thrombophlebitis and infections, encountering six cases of phlebitis and only one case of infection.

Post-surgery recovery

The principle of recovery in the limited arthroscopic resection of the meniscus was that of the operated knee. Its steps have been:

▪ Days 1–3: isometric muscular contractions in the first day and later the association with the isotonic ones; immediate walking with total charging in the isolated meniscus tears and with minimal charging, increasing progressively and slowly, in the association of the chondral lesions, in order to take the damaged articular cartilage out of charge.

▪ Days 4–14: physical recovery through specialized kinetotherapy, for muscle strengthening and the gaining of the pre-surgery articular mobility.

▪ Days 15–30: the progressive resuming of the daily activities.

▪ After 30 days: the resuming of the usual daily activity and sport activity.

The results of the arthroscopic meniscectomy

The assessment of the results of arthroscopic meniscectomy, form a global point of view, but especially from the point of view of the status of the articular cartilage, damaged or not at the same time as the meniscus, has been done on clinical, radiological and arthroscopic criteria.

Since the "monitoring" of the articular cartilage must be done on time, we have created two sub-groups of patients, with the same distribution of the lesion associations as the global group, that we have monitored for a period of time between 2 and 6 years, with an average of 4 years and 8 months. These sub-groups comprised 200 patients under 45-year-old and 50 patients over 45-year-old.

The clinical evaluation

This has been done for all the patients of the two sub-groups, using a clinical score that included the following elements: pain – subjective and objective, the functional articular ability, the trophicity of the quadriceps, the articular effusion and the degree of reprise of the daily or even professional activity. The results of this score are given in Table 4.

Table 4 – ***Clinical score of the late results of arthroscopic meniscectomy***

Results	Age under 45 years		Age over 45 years	
	No. of cases	%	No. of cases	%
Very good	186	93	27	54
Satisfactory	12	6	13	26
Unsatisfactory	2	1	10	20

The difference between the two groups is significant, the age and the degenerative process being the main elements that determined this difference.

In the age group under 45 years, those with unsatisfying results showed the association of a complex and large meniscal lesion with an old complete tear of the anterior cruciate ligament and chondral lesions of the IIIrd and IVth degrees of both femoral condyles. Those with only satisfying results have all had femoral or femuro-tibial chondral lesions of an advanced degree (III and IV), as well as lesion on the ACL.

The radiological evaluation

This has been done annually, for 75 patients of the group of less than 45-year-old, including all 14 who had weak clinical results, as well as all 50 patients older than 45 years.

A radiological "evolution" has been noticed with the clamping of the medial articular interlining in one case (1.33%) of the first sub-group (Figure 8). This was a patient who had a complex lesion of the internal meniscus associated to an old ACL lesion and a femuro-tibial internal chondrosis of the IVth grade, which required a subtotal internal meniscectomy, that refused the ligamentary plasty, and the tardive clinical result has been unsatisfying.

Figure 8 – ***The tardive clamping of the articular interlining after subtotal meniscectomy.***

In the patients younger than 45 years, the tardive radiological exploring showed progressive arthrosic changes in nine cases (18%), all of them having advanced and wide initial chondral lesions, with an unsatisfying late clinical result (Figure 9). We must take note of the fact that in this group there has not been any patient without initial chondral lesions or incipient lesions.

Figure 9 – ***Tardive femuro-tibial arthrosic changes after the meniscectomy.***

A difference is noticeable between the radiological evolutions of the two sub-groups, the explanation being this time given by the degenerative articular involution after the age of 45 years. In the first sub-group, even though it is a rather high percentage of associated chondral lesions, but most of them of an incipient degree, they determine tardive radiological modifications only in an insignificant percentage, a proof of their lack of an evolutional nature.

But, in the patients older than 45 years, where the advanced chondral lesions are prevalent, the tardive radiological modification show up in a much larger percentage and have a progressive nature; in the case of those without initial chondral lesions or with lesions of the Ist and IInd degree, few in the over 45 years group, the radiological and clinical evolutions have been favorable.

The arthroscopic evaluation

This secondary intervention has been done mostly on the under 45-year-old group, because the reason for the early intervention has been given mainly by the arthroscopic plastic of the anterior cruciate ligament (66 cases – 33%). In the second sub-group, the occurrence of the early "second look" arthroscopy has been smaller, only three patients (6%) needing a reconstruction of the ACL.

The tardive intervention consisted, with the first sub-group, of the ablation of the interference bolts, at about one year following the plastic intervention (1.5%), justified by a new trauma on the initially operated knee. In the second sub-group, the intervention has been tardive for the three patients with ACL plastia, in order to remove the metallic material.

The tardive arthroscopic observations in the patients younger than 45 years are represented by two cases of progression (4.76%) of the initial chondral lesions (both of them of the IIIrd/IVth degrees), both of them in patients with ACL plastia and with subtotal initial meniscectomy (Figures 10 and 11).

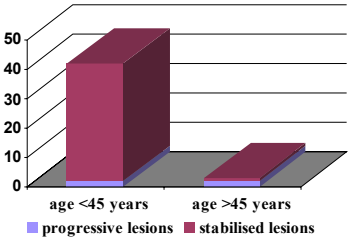

Figure 10 – ***The aspect of the articular cartilage after meniscectomy in the tardive secondary arthroscopy, on age groups.***

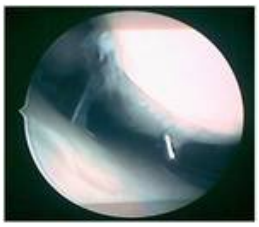

Figure 11 – ***Tardive arthroscopic aspect after subtotal meniscectomy in a 30-year-old patient.***

In the sub-group of older than 45 years, the three tardive secondary arthroscopies showed a relatively easy progression of the chondral lesions in these three patients, even though their clinical results were satisfactory (Figures 10 and 12).

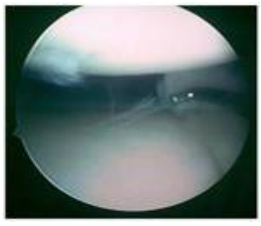

Figure 12 – ***Tardive arthroscopic aspect after partial meniscectomy in a 55-year-old patient.***

The microscopic study of the resected meniscus

Once the meniscectomy has been performed, the microscopic exam was subsequently possible, which we have done in a number of 20 surgical parts; 10 parts belonged to patients aged from 15 to 25 years, and the other 10 came from patients aged over 40 years. We have been interested in objectivizing the presence of some meniscal degenerative changes, which may be responsible for the alteration of protective functions of the meniscus after the fourth period of life (Figures 13 and 14).

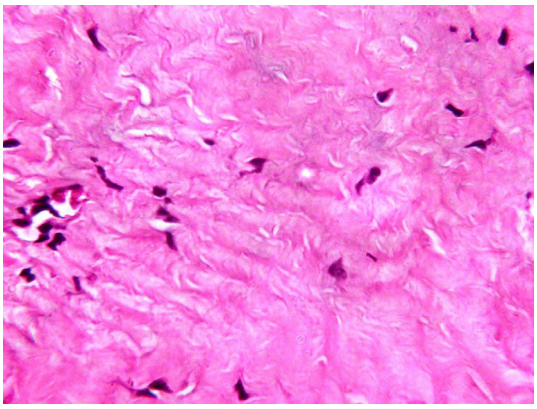

Figure 13 – ***Microscopic aspect of a normal meniscus, to a 15-year-old patient (HE stain, ×650).***

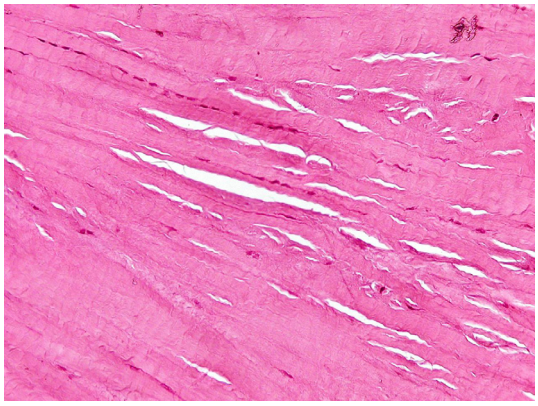

Figure 14 – ***Microscopic aspect of a degenerated meniscus, to a 50-year-old patient (HE stain, ×200).***

All the parts belonging to patients aged under 25 years presented a normal microscopic image, thus appreciated due to its aspect of collagen fibers clusters, which were mainly disposed circumferentially and without cleavage spaces between them (Figure 11). Moreover, the meniscocytes have an undamaged aspect, being numerous and appearing as oblong cells, with long nuclei, inter-bedded by collagen fibers clusters.

In contrast with this aspect of normal meniscus, all the meniscal bioptical preparations collected from patients aged over 40 years were characterized by the presence of global degenerative changes of the microscopic structure (Figure 12). The collagen fibers clusters have cleavage spaces between them and the fibrillary structure presents homogenates phenomena, and the meniscocytes have smaller dimensions and much rarer. All these elements prove the fact meniscal degenerative background is already presented in the fourth period of life.

In the patients from the group aged over 40 years, the meniscal arthroscopic intervention the bioptic collection of micro-cups from the femur articulation cartilage (non-carrying area), with the purpose of establishing its microstructural status. In all the studied chondral parts (10 patients), it is noticed the same incipient degenerative background, proven by the appearance of numerous cleavage spaces of the matrix, the decrease of the chondrocytes and focal granular degeneracy (Figure 15).

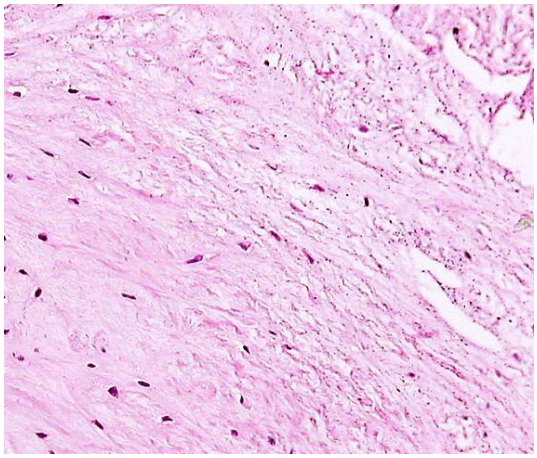

Figure 15 – ***Microscopic aspect of a third degree chondral lesion, to a 55-year-old patient (HE stain, ×100).***

Discussion

From the statistical analysis, we can note the frequent occurrence of the chondral lesions in the studied group, a situation that, along with the fact that they can be the starting point for a possible compartment arthrosis, justifies the interest we have shown in the further analysis of this type of lesion associated with the meniscal lesion. It is also important to stress the possibility of simultaneous lesions in both menisci, which increases the diagnosis importance of the arthroscopy of the knee, the classical arthrotomy being able to investigate both menisci only with unacceptable anatomical and functional sacrifices.

We also notice an extremely frequent occurrence of the lesion associations. Thus, we notice the small percentage of isolated meniscus tears (11.71% under 45 years and 2.87% over 45 years), with a significant difference between the two age groups, thus proving the reality of the presence of the incipient degenerative phenomena after this age. This phenomenon is also pointed out by various other authors [1–3], who talk about the early start of these meniscal and chondral degenerative changes, probably hereditarily determined, an asymptomatic stage, but pointed out macroscopically, arthroscopically, as well as microscopically through bioptic micro-cups.

It is very important to associate the meniscal tear with the tearing of the cruciate ligaments (mainly ACL), noticing that over half of the under 45 years group (57.44%) is in this category, another proof of the important traumatic factor involved in the etiopathogeny of these lesions, in the first age category. In comparison, only 11.42% of the meniscal lesions of those older than 45 years have been associated to a tear of the ACL, this statistical observation also working in favor of the predominantly degenerative etiopathogeny in this sub-group of patients.

While in the age group of under 45 years there have also been lesion associations that did not include chondral lesions (meniscus and ACL tear – 9.57%), in the over 45 years group, all associations included lesions of the articular cartilage. In young people, even though we have a rather high percentage of association of the meniscus tear with a chondral lesion (78.72%) and/or ligament tear (57.44%), most of these cases show incipient lesions of the cartilage (70.27%), their progression being stopped through an arthroscopic cure of the meniscal lesion and/or of the cruciate ligament.

In comparison, the over 45 years group has an extremely frequent occurrence of the association between the meniscus tear and a cartilage lesion (97.13%), on a generally stable knee when it comes to the ligaments (11.42% associated lesion of the ACL) and as a somber prognostic factor we must stress the prevalence of the advanced chondral lesions (degrees III and IV Outerbridge) within these associations (85%). We thus notice the arthrosic degenerative risk in these patients, the apparition of the meniscal lesion being an element of acceleration of the possible evolution towards arthrosis [1–5].

When it comes to the consistency of the pre-surgery

diagnosis with the intra-surgery one, established arthroscopically, the difference is significant, proving the natural limits of the clinical examinations, taking into account the variety of the structures of the knee which can be of issue (both intra- and extra-articular) and which only have a relative specificity of the clinical tableau. The NMR examination of the knee was not available for all the patients of the group, proving to be a much more precise method than the clinical one and which directs the patient towards a possible arthroscopic surgical intervention [6, 7].

Another element proving the importance of the arthroscopic method of diagnosis is the pointing out in the studied group of a number of 43 patients (4.16%) with a clinical symptomatology of tearing of one of the menisci and where it has been noticed, during the arthroscopic intervention, the lesion of the other meniscus, clinically undamaged. All these patients have had an excellent evolution after the performing of that partial meniscectomy, with the receding of the symptoms from the femuro-tibial compartment without changes.

All these data converge towards the obvious conclusion that there is a significant difference between the efficiency of the two methods of diagnosis, the clinical one and arthroscopic one, with a clear superiority of the latter [4, 5, 8].

Concerning the type of meniscus tear, this one, established arthroscopically, can prove the existence of the incipient meniscal degenerative process [9, 10]. Thus, in patients under 45 years, the combined meniscal lesions have consisted the most often in the association of a longitudinal tear with a radial or oblique one, resulting a "parrot beak" tear, and only very rarely has been the association of the horizontal cleavage; in comparison to this, in the second age group the situation is the opposite, most of the complex meniscal lesions, predominant in these patients, involve the presence of the horizontal cleavage tear, which is a characteristic sign of the dropping in the mechanical resistance of the meniscus, secondary to the incipient degenerative process.

From the point of view of the used meniscal resection type, the arthroscopy has allowed the accurate making of the partial meniscectomy, "conserving" the meniscal function, in most of the cases (91.25%), a technique that completely or almost completely preserves the basis of the meniscus, considered its functional area. Many studies done in time, by numerous authors, have underlined the necessity for the prohibiting of the total meniscectomy and the practicing of the partial meniscal resection, thus pointing out another major role of the arthroscopic surgery of the meniscus.

Thus, ever since 1948, Fairbank TJ thought about researching the tardive results of the total menisc-ectomies [11]. He compared the loading radiographs, pre- and post-surgery, of the patients with total meniscectomy, the interval being between 7 months and 14 years, and had the surprise of noticing constant, progressive, irreversible changes correlated to the increased deterioration of the clinical results in time. He called these changes "adaptive" and supposed they were secondary to the alteration of the biomechanics of the knee, following the total meniscectomy; at the same time, he noticed that they were the preliminary step in the global arthrosic degeneration of the knee he supposed that the menisci function as loading elements in the knee and that inside the collagen fibers in its composition there circumferential differences show up, opposing the extrusive forces that are placed upon them during the progressive loading. The later works of Bullogh PG and Arnoczky SP have proven that, indeed, the main orientation of the collagen fibers in the structure of the meniscus is circumferential [12–14].

Many later studies [9, 10, 15–19] have confirmed Fairbank's theory, proving that it is inadmissible to practice total meniscectomy and to approach the meniscal lesions through meniscectomy: Huckell JR, Cox JS *et al.*, Johnson RJ *et al.*, Kurosawa H and Fukubayashi T, Warren and Marshall, Rodeo SA and Warren RF, Rangger *et al.*, Mishra DK and Cannon DW.

Analyzing the main immediate complications of the arthroscopic meniscectomy, we notice that thrombo-phlebitis showed up in only the group of 645 patients where rachidian anesthetics have been used (occurrence of 0.93%), but that later the interventions of meniscal resection were done under local intravenous anesthetics, thus no complication occurring. The only post-surgery infection (occurrence of 0.1%) was a superficial one, solved immediately through conservative treatment, the proof of the "non-invasive" nature of the method. Also, the possibility and the advantages of the local anesthetics in this type of intervention are under-lined by many other authors, such as Rangger C *et al.*, Clough TM and Paul AS, Jacobson E *et al.* [19–21].

Thus, arthroscopy has made possible the accurate doing of partial meniscectomies and offered the possibility of solving, at the same surgical time, the associated articular pathologies; moreover, the post-surgical morbidity associated to the arthroscopic meniscectomies is very small, as compared to that of the classical meniscectomies, through arthrotomy, as note authors such as Johnson RJ *et al.*, Rangger C *et al.*, Chatain F *et al.* [17, 19, 22].

The results of the arthroscopic meniscectomy, from the point of view of the interrelation of these lesions with the state of the articular cartilage, have depended o the age of the patients, the type of meniscectomy (partial or subtotal) and the associated lesions (ligaments, cartilage), especially on the degree of the eventual initial associated chondral lesion.

Today it is a well-known fact that the results of the partial and limited meniscal resection are superior to those of the total and subtotal meniscectomies. These results include better functional scores of the knee, the decrease of the post-surgery morbidity, less hospitalisation time, an increased satisfaction of the patient and a small number of Fairbank changes in the tardive evaluation of the knee [19, 22].

On the patients under 45 years, the results have been encouraging, even in those with initial chondral lesions, if they were of the Ist and IInd degrees, results pointed out clinically, radiologically and arthroscopically,

without an obvious progression of these cartilage lesions. The patients with chondral lesions of the IIIrd and IVth degrees have had, the most often, a good or satisfactory clinical evolution (99%), even though the radiological and arthroscopic exploration has shown in very few of them the progression of the chondral lesion (1.33%, respectively 4.76%).

The over 45 years subgroup has been characterized by a smaller percentage of good results, both clinical (80%) but especially radiological (82%) and arthroscopic, the unsatisfactory ones being given especially by the patients with advanced chondral lesions. The intervention on the meniscus did not stop the evolution of the chondrosis, but it brought an improvement of the symptoms, directly proportionate to the "contribution" of the meniscal lesion (on a degenerative background) to the global clinical tableau. The patients with incipient chondral lesions, of the Ist and IInd degrees, even though they were rarer in this age group, had an increased incidence of the satisfactory clinical and radiological results.

The results obtained in the group of patients with partial arthroscopic meniscectomy that we have studied are in accordance with the data in the specialized literature; thus, Chatain studied a number of 317 patients, of a total of 894 who suffered a partial internal arthroscopic meniscectomy, the observation period being between 10 and 15 years (the average of 11.5 years). In the year 2001, he makes public the results of this study, 91% of the patients with good clinical results, and the unchanged radiological aspect being noticed at about 88% of the patients involved in this research. The weak results appeared in the patients older than 35 years with initial chondral degenerative lesions and with a needed sector meniscectomy [22].

The anatomo-pathological study of the meniscal lesions in the two age groups has clearly shown the presence of the degenerative phenomena in the over 45 group, an essential factor responsible with the quality of the functions of the remaining meniscus, as well as its resistance to increased mechanical requirements, an aspect talked about by authors such as Pendleton A *et al.*, Arrich J *et al.*, Buckwalter JA and Mankin HJ [2, 23, 24].

These data allow us to believe that the limited meniscal resection, done arthroscopically, can restore in a significant percentage the meniscal functions, in the circumstances of a tissue without degenerative processes, even only microscopic ones [5, 8, 11, 16, 25, 26].

Regarding the microscopic aspects of the meniscal resection, the observations that we achieved are concordant with the data provided by authors such as Pendleton A *et al.*, Rangger C *et al.*, Chatain F *et al.* or Buckwalter JA and Mankin HJ, also underlining the importance of the meniscal degenerative process [2, 19, 22, 24].

So, on believe that the main etiopathogenic element in the cause of meniscal lesions in young people is represented by the traumatic agent with low intensity, not by a possible meniscal degeneracy.

The incipient degenerative meniscal phenomena, microscopically proven and occurring already after the age of 40 years, have a decisive role in influencing the mechanical and biological behavior of the meniscus, leading to the progressive decrease of its mechanical resistance, as well as the quality of the femur-tibia elastic "damper". This way are explained the occurrence of the meniscal lesions after minor traumatisms at this age group, lesions leading to the secondary alteration of the articulation cartilage, femur-tibia cartilage which as it has been microscopically proven after the age of 40 years also bears an early degenerative process already triggered. Thus, by this harmful mechanism, based on the early degenerative process meniscal and chondral at the same time, proven by this microscopical study, in people over 40-year-old, with a clinically normal knee, an early knee can be triggered, after minor articulation traumatisms.

Conclusions

Although the arthroscopic method of approaching an important part of knee pathology has a diagnosis and mostly a therapeutic purpose, it allows also the histological study of the operated on meniscus, which cab provide extremely important data regarding vascularisation, trophicity and its mechanical resistance.

The results of the study show that there is not always a correspondence between the undamaged macroscopical aspect and the microstructural one, the tissue degenerative process once triggered being able to influence negatively the patient's belated prognostic, irrespective of his age.

The establishment of the microstructural quality of the meniscus with a macroscopical lesion, possible once the therapeutic intervention has been performed, and allowing the bioptic assay, will be able to modulate the early and belated postoperative recovery of the patient, with the final purpose of ensuring the mechanical protection of the articulation cartilage and thus preventing the early occurrence of secondary arthrosic lesions.

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Received: January 14th, 2010

Accepted: May 28th, 2011