

THERAPEUTIC TEST AND PROBABILISTIC APPROACH : REVISITING THE OSTEOPATHIC DIAGNOSIS ON THE BASIS OF THE THERAPEUTIC ACT MODEL

Introduction

Osteopathy is still a young medicine which, as everyone knows, has significantly developed throughout the world in just 150 years. Today, and particularly in France, it enjoys such a high status which was unanticipated as recent as some 20 years ago, enabling it to attain about 25 million consultations each year. It is therefore becoming a real mass medicine in many countries. A twofold engagement arises from attaining this status: first, osteopathy is increasingly involved in dealing with public health problems such as back pain, musculoskeletal disorders, functional colopathy, infant torticollis and the physical autonomy of the elderly; secondly, it is, *de facto*, considered by patients as a stakeholder in the provision healthcare. Hence, it has the duty to take on certain responsibilities with regard to the world in which it operates, not the least of which is taking account of considerations which are purely economic. It must also practice self-criticism and systematically stepping back to reconsider models of thought that have guided it since 1872 and which are sometimes liable to muddle the pertinence of the diagnosis made by the osteopath. Indeed, the latter, while often focused on the search for the causes of the ailment do sometimes neglect the strictly symptomatic aspect of it, yet determinant in the choice of treatment.

At a time when neurosciences are providing exciting insights into many aspects of clinical research, such as the placebo effect, inherent effectiveness or potentiation of treatment, we regard the principle of therapeutic testing as a tool susceptible of being used to address many thorny cases in terms of diagnostic approach. Such a procedure, which straddles the elaboration of the diagnosis and the realization of a treatment, consists in applying a predefined therapeutic technique and then monitoring the patient, on the basis of the evolution of indicators related to the reason for consultation, in order to determine, *à posteriori*, if the treatment choice made was a

judicious one. It should be noted that the treatment in question, which falls under the probabilistic approach, is not defined according to the history of the ailment nor its mode of onset but its chances of success in the face of a given clinical picture.

Deterministic thinking model versus probabilistic approach

Clinicians' thinking models are often prescribed by principles of the relation between cause and effect. These reasoning principles are fairly standard and the resulting biases are well known. Such argumentation may seem perfectly praiseworthy, since at the root of any scientific procedure there is always some observation. However, one has the right to question the therapeutic and sometimes the intellectual effectiveness of such a diagnostic approach. In fact, whether we like it or not, the world of health as it exists today incorporates fundamental economic variables. Thus, in order for an osteopathic consultation to become worthy of espousing the current offer of healthcare, the means of achieving a conclusive result cannot be extended to infinity. These means, including those with regard to diagnosis, must allow for saving time and energy. However, deterministic thinking, driven by principles of cause-and-effect relationship can, quite often, result in a loss of time (hence delay in the effectiveness of the treatment and in the progress of the patient's condition) because it is deprived of certain solutions intended to treat a particular effect on the ground that they do not act upon the cause. In the field of risk management, the deterministic approach is only used in specific sectors of activity such as air transport or nuclear safety where, even a very small risk is considered as a serious threat liable to cause irreversible damage.

But what are the risks managed by the osteopath? Are they so damaging that they require such an expensive and time-consuming approach?

Osteopathic theories are old, however, nowadays they benefit from a collection of technological knowledge and tools sufficient enough to allow for their development. Or their falsification ... It thus seems reasonable, in 2017, to avoid any deterministic reasoning in order to favor a probabilistic approach.

Such an approach makes it possible to identify a range of existing solutions and to create profiles of patients for whom these solutions are truly effective. This approach also bears undeniable economic, intellectual and ethical advantages, in the forefront of which is the fact of taking on a treatment adapted to the patient and his or her ailment, and to ensure that such treatment can embrace multi-disciplinary caretaking (we shall come back to this point later). In other words, it consists in placing patients in some kind of "boxes" and defining the best treatment for them according to their generated profile; this "best treatment" being, naturally, comprehensible by the other health actors. The osteopath, just like the physician, the physiotherapist, the chiroprapist, the posturologist or the psychologist, has at their disposal a toolkit which, though well-furnished, is still limited and must draw up profiles, based on relevant criteria, and then determine which profile best corresponds to each patient, in order to define the statistically most appropriate protocol. So it all boils down to matters of statistics. Or rather, shall we say that by claiming to have attained the status of medicine, osteopathy can no longer afford to discard statistics from its decision-making mechanisms. This may seem contrary to the principles of a holistic approach, but it is a very good way to justify the use of osteopathic practice and to understand its limits. Thus, who would refuse to play a given lottery combination if the probability of winning with it was known beforehand to be 10 times better than the other combinations? For how long will osteopathy be able to evade the obligation to validate the effectiveness of its treatments? Studying the statistical validity of a diagnosis is a particularly difficult and almost impossible task in the case of functional disorders, *a fortiori* when the notion of causality is at stake. On the other hand, the effectiveness of a treatment can easily be analyzed, so too can conditions for its effectiveness.

The direct consequence of this probabilistic approach is that the osteopath must be interested at least as much in the profile of the patient as in the mode of the onset of his or her condition. Sometimes the osteopath can draw on obvious factors in order to understand the cause of the condition, but there are numerous cases where this stage of diagnosis is not possible. In such situations, all that the osteopath has to know is

whether or not there is any contraindication to the caretaking of the patient by the therapeutic tools that are at his or her disposal. It is a situation frequently found in chronic pain that start insidiously, for which the patient has not identified any triggering factor, and which appear to be multifactorial or which bears intercurrent features. Under these conditions, it is the observation and the follow-up of the patient that will make it possible to verify, *a posteriori*, the relevance of the treatment with respect to the symptoms. Is it necessary, in such a situation, to have understood the origin of the problem? The answer is "no" if the treatment is effective over time, if it has fewer contraindications than alternative treatments or, if it has saved time and resources.

The pedagogical implications of a probabilistic approach

The probabilistic approach focuses on the supposed effectiveness of a treatment, within the meaning of the ratio between the expected benefits and the risks incurred, on the basis of a given clinical chart. This research activity is not oriented towards the causal relationship between a clinical phenomenon and the patient's medical history but rather towards the balance between a therapeutic caretaking and a clinical phenomenon. Targeting this competency calls for prior pedagogical orientations that we could, with regard to the learner, summarize as follows, he or she has to be able to:

- characterize the functional disorder from judiciously chosen criteria
- establish a parameterization of the individual
- master therapeutic acts on the theoretical basis
- master therapeutic acts on the gestural basis

The first two items relate to the understanding of the patient's condition at the time of consultation, irrespective of his or her medical history and the mode of onset of the condition. The last two items relate to the choice and the execution of the gestures intended to modify the patient's condition.

The choice of the criteria for the characterization of the functional disorder and for the parameterization of the individual must be based not only on empiricism and professional consensus, but also on data from literature recognized as reliable, easy to qualify and, as far as possible, relatively easy to quantify. Examples that can be referred to include; pain, muscle stiffness, segmental morphology, tissue flexibility... etc.

Theoretical mastery of therapeutic acts include the knowledge of the specific effects, biological and neurophysiological modes of action, the expected clinical consequences, indication/contraindication ratio and benefit/risk ratios, but also the knowledge of the natural history of the ailment.

The gestural mastery of these acts necessitates training and evaluation of their execution in relation to factors of success, of implementation modalities and of observable performance criteria. This mastery must also include adaptation to the nature and characteristics of tissues.

It is clear that taking into account the medical history of the individual is likely to impact on the opportunistic diagnosis and on the choice of therapeutic tools that will be used to meet his or her demand.

In the face of the structure-function relationship models which are usually taught in schools of osteopathy, a model of the therapeutic act could, therefore, equally be proposed. From a strictly didactic point of view, it would even seem judicious to consider teaching this model first before teaching the diagnostic principles. In any case, targeting these diagnostic principles solely on the understanding of pathogenic mechanisms may appear to be perilous in the light of the contraindications and risks associated with the performance of certain osteopathic acts and, even insufficient in the light of the medical indications and expected benefits. The diagnostic approach should, once again, allow the practitioner to choose the best treatment protocol in with regard to the symptoms expressed by the patient and the clinical signs observed. The first pedagogical consequence of this postulate is that osteopathic tests should be taught as early as possible, not with the aim to allow students to understand what has

happened, but to make them understand which therapeutic acts they will have to apply to meet the demand of the patient. At this stage, it is important to make them understand that it does not imply that they will be trained to systematically reject the distinct personality of each patient, neither his or her medical background history nor the manner of the onset of the condition. Indeed, the caretaking practiced by the osteopath is not restricted to the manual acts practiced *in fine* on the patient. These acts may appear to be relatively repetitive in an ordinary consultation day, nevertheless, the precise modalities of accomplishment, the hierarchy of acts and the accompaniment of the patient are specific to each new case, depending on the medical history, the psychology, characteristics of the functional disorders of the patient, and risk factors particular to the individual.

However, even if they assume an interesting feature with regard to the future professional practice of the student, these pedagogical notions lose their pertinence when they are not confronted or associated with ethical and epistemological reflections.

The intellectual trap in the search for the cause

Of course, some osteopaths will claim that any professional, worthy of the name, must be able to find the cause of an ailment and to characterise it thanks to their particularly developed tactile sensitivity. Against such argument we can put forward three objections:

- The first is that we are talking here about training and education in diagnosis ; developing tactile sensitivity and being able to interpret subtle clinical situations after years of experience is one thing, whereas teaching such a fine and precise feeling and, above all, being able to evaluate a student on such exceptionally difficult criteria to observe, is quite another
- Secondly, it is not in consultation cabinets, within the framework of individual practice, that recommendations for good practice are formalized; the diversity and,

foremostly, the lability of the osteopathic tests are such that it is impossible to make an objective link between a clinical situation and a structural reality. We have all known a case whereby a single patient could give rise to as many osteopathic diagnoses, thus to as many treatments as to the number of osteopaths working on his or her case ... And yet, each osteopath is likely to have the same effectiveness as any other.

- Thirdly, scientific literature teaches us that certain types of treatment can have the same relative effectiveness and that only the benefit/risk or indication/contraindication ratios are susceptible to tip the balance towards a particular protocol

Further, there are many cases where the search for the cause is severely hindered (e.g. in intercurrent chronic pain, uniquely taking place at night, or after a particular effort) or even vain (in the case of a violent traumatic history or malformation). In such cases, deterministic models infer explanatory reasoning which, quite often, is close to speculation, more especially in the field of functional disorders where it is often difficult to link the ailment to an anatomically visible structural alteration. Since the reality of an ailment is very complex and often multifactorial, it must be acknowledged that a perfectly individualized treatment is impossible. Let us take the example of Fryette's laws: if we consider n blocking possibilities for x articular parts, this would mean that for each individual the number of osteopathic diagnosis possibilities regarding pain affecting the vertebral column would be n^x which, for 26 bone pieces with (in a simple example) 6 blocking possibilities (2 per motion axis), would give $6^{26} = 1.7 \times 10^{20}$ situations. Aside from Artificial Intelligence, which is capable of producing 1.7×10^{20} different treatments to respond to as many osteopathic diagnoses? It should be borne in mind that we are talking here of the spinal column only and that we have not yet dealt with the n^x possibilities of treatment related to the limbs, the cephalic sphere or the visceral system and, still less of the associations between these different systems. Even in setting aside Fryette laws and keeping a strictly holistic reasoning, there is a risk of falling into the trap of the numerous solutions available. It is

reasonably necessary to create treatment scenarios for classifying clinical tables and the protocols adapted to these different tables. As we have previously seen, this does not forbid customizing the treatment and adapting it to each clinical case.

Finally, cognitive sciences reveal the existence of several biases that taint the usefulness and the efficiency of the research for the cause: mainly biases of anchoring, confirmation, representativeness and availability. Associated with sources of errors such as pain subjectivity, individual anatomical varieties or the concomitance of pathogenic events, these biases confine the practitioner to within a reasoning that is more of sophism than of an irrefutable demonstration. However the main consequence of an approach centered on the search for the cause lies in the impossibility of the ensuing treatment to incorporate pluri-professional caretaking. How could a team of practitioners be brought to work together on a patient, if only one of them is susceptible of acting on the origin of the pain or the dysfunction? How can an alternative practice be evaluated and compared to others if it is never placed in the field of purely symptomatic treatment? The main risk of such reasoning is the isolation of the one who entertains it.

Rethinking the osteopathic diagnosis

We have just seen, hereinabove, how the deterministic approach entails a number dangers for the notoriety and the recognition of our profession, however, it should, nevertheless, not be condemned because it is simply specific to the human nature. The greatest source of error is the quest for meaning, to which every sensitive human being naturally subscribes. Whereas it is quite easy to explain to a patient "why" they feel pain, it is much more complicated to make them understand "how" they have the pain. More precisely, it seems easy to satisfy their demand on the "why" of the pain, while the "how" raises many questions and obliges going into a long and complex discussion, which risks to strongly reinforce the patient's concern. At this point, let us be practical: patients who suffer from hyperalgesic acute low back pain, chronic headaches or functional colopathy naturally feel the need to know what causes their pain. If they are

told that they are suffering from a herniated disc, reversal of cervical curvature or dolichocolon, they are given an answer on the cause of their suffering and are given the impression that the treatment to follow makes sense. However, there are people with a herniated disc who have little or no back pain at all, individuals with reversal of cervical curvature who do not complain of headache and, on the contrary, there are certainly patients suffering from functional colopathy without being characterised as having an elongated colon. These elements, be they of a morphological, histological, neurological or environmental nature, are to be considered as risk factors, of which the probability of being involved in the advent of a functional disorder is regarded to be more or less elevated, but without precise knowledge of why the dysfunction occurs in one individual rather than in the another (because no studies on the matter have been conducted or it is not yet possible to do so). Moreover, in the cases just cited, knowing the cause does not allow justification of caretaking by the osteopath, because in none of these cases has osteopath the possibility of changing the structural condition of the patient. It is therefore the characterization of the functional disorder and not the understanding of the cause of the pain that should guide the osteopath in the choice of the treatment protocol. The practitioner must then decide on the order and nature of the therapeutic acts (by taking into account well informed counseling), not only in terms of carefully selected parameters such as pain level, age and the activities of the patient, muscular quality, flexibility and, of course, the patient's consent, but also in function of the clinical consequences of the acts, their therapeutic modes of action, their expected effectiveness with respect to the natural course of the condition, the risks incurred and the expected benefits, some known benign adverse reactions, etc. This is where we turn back to the probabilistic approach! An approach which will be all the more justified if we do not have the immediate means to identify the presence of a disc herniation, a modification of the vertebral curvatures or a dolichocolon ... Beyond these few cases, the use of the therapeutic test is much more frequent than thought.

The elaboration phase of the osteopathic diagnosis must, therefore, include as much the "calibration" of the acts that will be practiced as the understanding of the pathogenic mechanism. The general practitioner does nothing different when he or she is faced with a priori benign pain or a classic syndrome. The well-known triad of painkillers, muscle relaxants and anti-inflammatories responds favorably to many a situation and, the doctor's principal task involves ensuring, not so much that the cause of the reason for consultation is clearly identified as that the patient has no contraindications to the proposed treatment. The practitioner is aware that, statistically, the triad will bring beneficial effects in a majority of cases. Hence, this first step allows "getting rid" of spontaneously resolving conditions before focusing on conditions rebellious to treatment, in the second stage and, if necessary, to envisage further in-depth clinical and paraclinical examinations, in order to allow for the adaptation of the treatment in residual cases. Is there anything wrong with that? When we are practicing mass medicine, to which millions of patients turn, and we are called upon to work within a regulatory, socio-professional and economic framework which is relatively restrictive, why should we rid ourselves of the rules of good practice which are applicable to other health professions? The fact that these rules are partly dictated by economic, ecological (in the sociological sense of the term) or even utilitarian imperatives, is not defamatory. On the one hand, it has never been proved that the effectiveness of a treatment is correlated with the time spent on the elaboration of the diagnosis. On the other hand, the real added value of the osteopaths lies in their therapeutic acts, and not in the specificity or reliability of their tests (quite the contrary, according to the numerous publications on this subject). One can even consider that a certain collective ethic is emerging from such procedures.

If one accepts this postulate, then should an osteopath, faced with whatsoever reason for consultation, not ask himself or herself the following three questions:

- 1) Am I legitimate to take care of this patient?
- 2) Am I Potentially Dangerous ?

3) Am I potentially effective ?

On careful reflection, the notion of causality has little interest in these considerations. On the other hand, the choice of treatment according to its expected effects, risks and benefits, indications and contraindications, and according to the characteristics of the individual and his or her functional disorder, become crucial here. Even though certain situations may escape our understanding of the mechanism of the ailment, our clinical examination must, above all, enable us to answer these three fundamental questions, the ethical dimension of which is implacable. Let us first content ourselves with making decisions based on this and monitor the patient's progress whilst never forgetting, if we want to be honest, the natural history of the ailment.

Conclusion

Epidemiological studies on the reasons for consultation in osteopathy demonstrate that patients ask osteopaths to, above all, treat their pain. With some touch of provocation, one might wonder whether it really matters to them that the practitioner has fully understood the pathogenic mechanism or not, as long as he or she responds to this straightforward request.

Subsequently, since the probabilistic approach is so widely used in many fields of human activity it is high time that we asked whether osteopaths should equally adhere to it. From all the above, it appears that the idea of seeking to carry out a precise etiological diagnosis at all costs, is not necessarily of primary interest. Besides, it is rarely indispensable and sometimes even dangerous, especially when practitioners become so obsessed with it that they confine themselves to a quest that has sense to them only before having any meaning to the patient.

At a time when osteopathy is becoming more and more essential in the provision of care, the socio-economic aspect of our professional practice can no longer be overlooked for, even if we refuse to admit it, other health professionals and administrations, among others, are observing and judging us in this light. Thus,

although decision-making guided by research and understanding of the cause may sometimes appear to be relevant, we must agree that it could lead us to situations which are conflicting at both scientific and intellectual level, inefficient economically, nonfunctional therapeutically and, sometimes, ethically embarrassing.

In order to show that we are able to focus our diagnosis approach on the adequacy of the treatment in function of the symptoms and not in function of a presumed cause, appears to us to be the best way to simplify our professional practice, in the eyes of the other actors of the health system, to integrate inter-professional collaborations and to meet the expectations of patients. The latter's wish is to see health professionals caring for them together as a team.

This implies the implementation of specific pedagogical actions, notably within the framework of clinical training. However these actions must be brought in as early as possible in the teaching curriculum, especially with regard to the modeling of our therapeutic acts, be they specific to the osteopath or shared with other professionals. The stakes are quite high for the development of our profession, but they are accompanied by a hurdle at the entry which must not be eluded: the training of teaching staff. It is a new challenge for schools of osteopathy because, it is common knowledge that the coherence of the various trainers around an osteopathic pedagogical project is not always simple to implement...

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